ANNOTATED VASCULAR FLORA OF THE DEAD HORSE MOUNTAINS, BIG BEND NATIONAL PARK, TEXAS, WITH NOTES ON LOCAL VEGETATION COMMUNITIES AND REGIONAL FLORISTIC RELATIONSHIPS

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ABSTRACT

The Dead Horse Mountains of Big Bend National Park are one of the least explored areas in Texas. This is the first collective body of work to document the area's vascular flora through a major new collection of vouchered specimens and a survey of existing herbarium specimens. Field work was performed between August 2003 and September 2006. The study area covers 176,800 acres (71,548 hectares; 276 mi², 715 km²) with a 4100 ft (1250 m) range in elevation. Non-vascular specimens (bryophytes, hepatophytes, and lichens) were also collected but not included in the final analysis. A total of 1584 vascular specimens were collected during the current study; a herbaria search uncovered 2212 previously-collected vouchers. The flora consists of 662 species in 344 genera and 91 families. The best-represented families are the Asteraceae (80 species), Poaceae (75 species), Fabaceae (52 species), Euphorbiaceae (34 species), Cactaceae (34 species), Pteridaceae (20 species), and Boraginaceae (20 species). *Seymeria falcata* var. *falcata* was collected for the first time in the United States while eight new species were recorded for Brewster County. One additional taxon (*Galactia* sp.) may be undescribed or new to the United States. Vouchered taxa increased by 12% and 55 species were documented in the study area for the first time. Twenty-four non-native species are known from the study area; three are state-listed noxious weeds, and six are considered invasive. The number of known Texas endemics in the Dead Horse increased to 11; seventeen species are considered rare. The Dead Horse flora differs from other southwestern floras mainly by an increased relative importance of monocots, and the elevation of the Poaceae to be co-dominant with the Asteraceae. These and other factors suggest connections to several peripheral floristic areas, ranging from the Mogollon Rim and the Great Plains to South Texas and southern Mexico.

RESUMEN

La Sierra del Caballo Muerto del Big Bend National Park es una de las zonas menos exploradas en Tejas. Este es la primera investigación que documenta la flora vascular de esta zona mediante una colección importante de especímenes nuevos y un examen de los especímenes existentes en herbarios regionales. La investigación fue realizada entre Agosto 2003 y Septiembre 2006. La zona de la investigación cubre 176.800 acres (71.548 hectáreas; 276 mi², 715 km²) con una gama de 4100 pies (1250 m) de elevación. Especímenes de plantas no vasculares se recogieron pero no fueron incluidos en el análisis final. Durante el estudio actual, se recogieron unos 1584 especímenes de plantas vasculares; en la búsqueda de herbarios se encontraron 2212 especímenes recogidos anteriormente. La flora final consiste en 662 especies de 344 géneros y 91 familias. Las familias mejor representadas fueron las Asteraceae (80 especies), Poaceae (75 especies), Fabaceae (52 especies), Euphorbiaceae (34 especies), Cactaceae (34 especies), Pteridaceae (20 especies), y Boraginaceae (20 especies). *Seymeria falcata* var. *falcata* fue recogida por primera vez en los Estados Unidos, y fueron registradas ocho nuevas especies para el condado de Brewster. Una colección adicional (*Galactia* sp.) puede ser una especie nueva o una especie desconocida en los E.U. El número de taxa con especímenes documentadas creció en un 12%, y 55 especies fueron documentadas en la zona del estudio por primera vez. Se reconocen 24 especies exóticas en la zona del estudio; nueve se consideran plantas invasoras o hierbas nocivas. El número de especies endémicas de Tejas que se han encontrado en la Sierra Caballo Muerto subió a 11; diecisiete especies se consideran raras. La flora de la Sierra del Caballo Muerto se distingue de otras floras del sudoeste de los E.U. principalmente por el incremento en la importancia relativa de las Monocotiledóneas, y por la elevación de las Poaceae hasta el punto de ser co-dominantes con las Asteraceae. Estos y otros factores sugieren que existen conexiones con varias áreas florísticas periféricas, extendiéndose desde el Mogollon Rim en Arizona y los Grandes Llanos de los E.U., hasta el sur de Tejas y México meridional.

INTRODUCTION

The Dead Horse Mountains (DH) of Big Bend National Park (BBNP) create a remote and forbidding viewscape on the West Texas park's eastern skyline (Fig. 1). The rugged limestone escarpments offer no reliable surface water, nor infrastructure allowing quick access to the interior, leading to claims of it as being uncharted wilderness (Wood et al. 1999). These logistical challenges, in addition to rugged topography and extreme climate, have left the area one of the least botanically understood areas in Texas and the northern Chihuahuan Desert Region (CDR). Much collecting has taken place in the area over the past 100 years. The height of early scholarly investigations came in the 1950s–1960s, and included a SRSU master's thesis by Rogers (1964), a short but excellently characterized field report by Wells (1965), and collections by numerous professionals including Sul Ross State University (SRSU) botanist Barton Warnock. The largest coherent body of collections was made for a report to the Nature Conservancy (Amos and Giles 1992), which at the time owned a part of the study area that is now part of the Texas Parks and Wildlife's Black Gap Wildlife Management Area.

The majority of vouchers made through these efforts came from more easily-accessible areas, near roads and trails peripheral to the heart of the range, without widely sampling the range of niche habitats existing in the area. Despite a rather active historical interest in this area, no overall floristic characterization has been made for the Dead Horse. Several lists of local flora exist, including more than one in use for Big Bend National Park; however these are based on sightings, literature reports and, to an unknown degree, herbarium specimens (Mahler 1971; National Park Service 1996; Louie 1996; Clelland 2001; Worthington 2001; Alex et al. 2006).

A floristic analysis of the Dead Horse will create an important context for Big Bend regional floristics. The DH are located in the Trans-Pecos Mountains and Basins vegetational area (Hatch et al. 1990) but phytogeographic connections have been noted with other Texas floristic areas including the High Plains, Rolling Plains, Edwards Plateau, and the South Texas Plains, also known as the Tamaulipan Thornscrub region (Powell 2000). Connections to more northerly vegetational areas are evidenced by the populations of aspen (*Populus tremuloides*), Douglas-fir (*Pseudotsuga menziesii*), and other Rocky Mountain species growing well south of their normal distributions. Floristic links also reach south to the Sierra Madre Oriental and Occidental, expanding to the greater CDR of Mexico (Larke 1989). The graminoid flora even has an affinity to the Great Plains grasslands (Powell 2000; Christie 2006). Because there are so many regions intergrading in the local area, there is high potential in the study area to discover species out of their expected ranges. Furthermore, the DH is topographically complex and the resulting microclimates may harbor species new to science. Already the area shelters several little-known species: *Andrachne arida* is known from only a few localities in the CDR and has not been seen in the DH since the 1960s, while the purported Dead Horse endemic *Hedyotis pooleana* has not been observed since the original 1985 collection. Other species are assumed to occur in the study area based on their known habitat, but are not well understood, being known only from a few collections in a restricted area. One such example is *Bouteloua kayi;* previous to this study it was not known to occur in the study area but was discovered during the current work.

The environmental complexity, in both topography and regional climate regimes, no doubt has helped to produce the numerous endemic species of the CDR, but instead of being widespread, endemics are mostly locally distributed (Brown 1994). Indeed, in Trans-Pecos Texas, Brewster County tallies the highest numbers of endemic (TAM-BWG 2007) and rare plant species (Alex et al. 2006; Poole et al. 2007). Often, however, species of concern are little known beyond data taken at their original collection site. Thus, targeted field studies in Chihuahuan Desert areas like the Dead Horse have a high potential for new floristic discoveries.

The main objective of this project was to create a collective body of work describing the floral composition of the DH. Goals to accomplish this objective included: (1) developing an annotated flora for the study area through documenting existing voucher specimens in regional herbaria, and through new collections from a wide variety of underrepresented areas and habitat niches in the range; (2) gaining more knowledge about little-known species that occur in the range, including species known regionally but not yet recorded



Fig. 1. The Dead Horse Mountains study area. Western slopes of central portion of the range, with Sue Peaks at left of center.

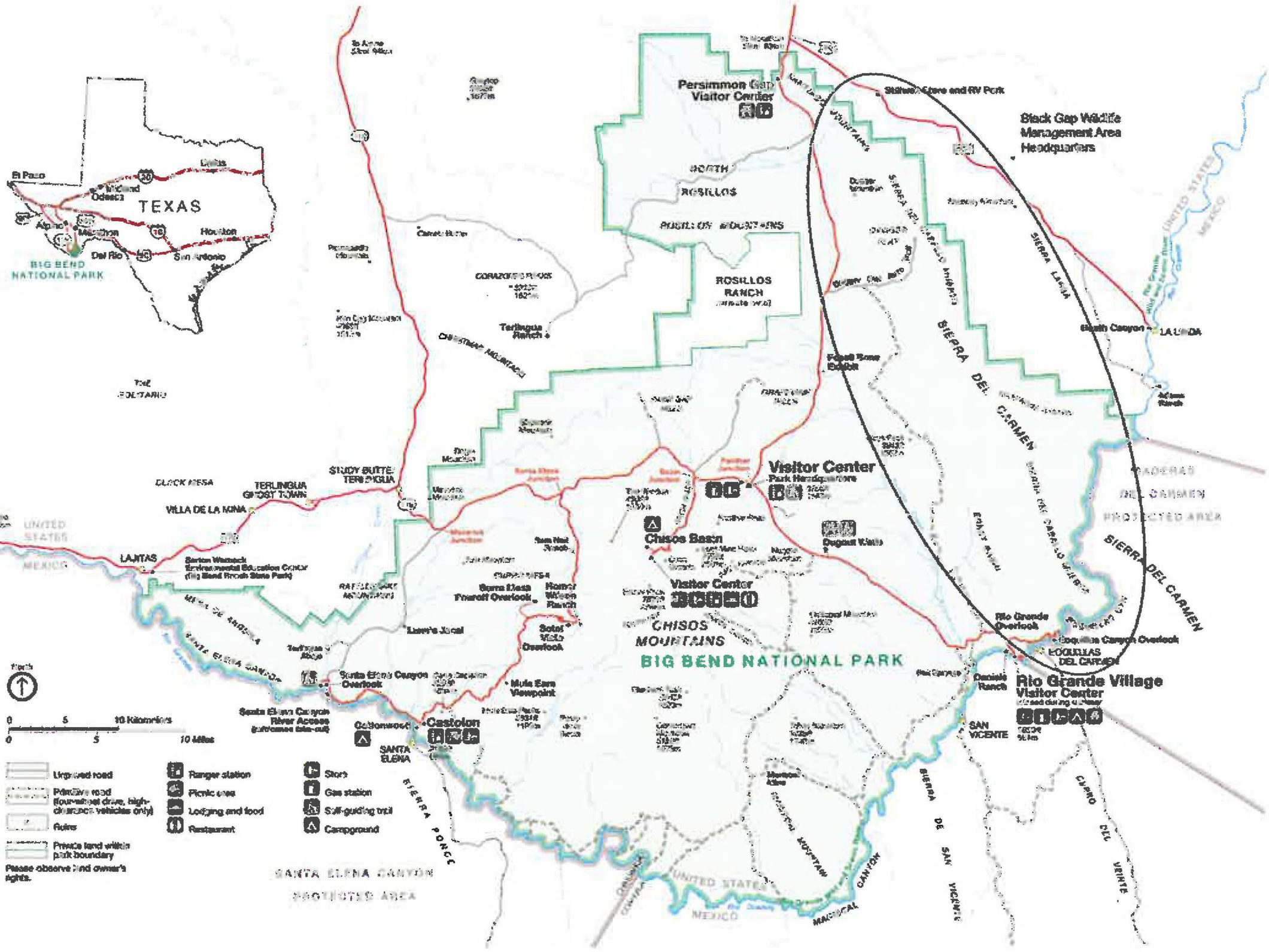


Fig. 2. Map of Big Bend National Park (NPS 2004) with the study area circled. The Dead Horse Mountains are labeled "Sierra del Carmen" and "Sierra del Caballo Muerto."

within the study area; and (3) documenting the occurrence of novel species for the study area, whether rare, disjunct, or invasive, and providing new insight into their distributions and habitat requirements. Subsequent analysis was used to interpret the Dead Horse flora in a larger regional context within the Trans-Pecos and also the larger southwestern United States. The study was conducted as the first author's MS thesis research (Fenstermacher 2007). The full thesis manuscript, the entire voucher collection database, and many related photos can be found on the Cactus Conservation Institute, Inc. website: http://www.cactusconservation.org/CCI/botany/fdhm.html.

Site Description

The DH are located in the Big Bend region of western Texas, in southern Brewster County about 80 mi south of the town of Alpine (Figs. 1, 2). The study area boundary starts in the northeastern part of the national park at Dog Canyon, continues south along the western foothills of the DH, and extends east into a portion of Texas Parks and Wildlife's Black Gap Wildlife Management Area (BGWMA), including a few parcels of private ranchland (Fig. 3). The Rio Grande marks the southern limit. The DH are a smaller, northern extension of the impressive Sierra del Carmen of northern Mexico, exhibiting similar physical characteristics: northwest-trending ridges alternating with alluvial basins, and generally rugged, arid, rocky terrain. Extending 31.5 mi (51 km) N/S and an average of 8.5 mi (14 km) E/W, the study area covers approximately 176,800 acres (71,548 ha; 276 mi^2, 715 km^2), and ranges in elevation from 1800 ft (549 m) at the Rio Grande to 5840 ft (1780 m) at Sue Peaks in the heart of the range.

The only major physical feature that trends east-west in the study area besides Boquillas Canyon along the Rio Grande is the 14-mile-long (22.5 km) Telephone Canyon that bisects the DH. There are several major drainages in the study area, but there is no permanent surface moisture. Any precipitation that occurs usually flows overland into the dry arroyos, creating powerful but temporary floods draining towards the Rio Grande. Away from the river, surface water is found only unreliably in tinajas, i.e., stone basins eroded usually out of arroyo or canyon beds with bedrock outcrops. The study area experiences hot summers and cool-to-cold winters. The average annual high is 85°F while the low averages 53°F with an average annual maximum of 100° F/38° C and minimum of 33° F/1° C. Large diurnal temperature ranges are common, with a mean of about 32° F/0° C and a maximum of about 50° F/10° C. Precipitation peaks between May and October, the 10 in/25 cm yearly average falling usually as late afternoon thunderstorms that range in intensity and often create hail (temperature data from National Park Service, Big Bend National Park, unpublished data).

The DH are composed primarily of lower Cretaceous limestone deposited in a deep sea environment ca. 180 mya. As the area was close to the shoreline of the great interior sea, and as sea levels fluctuated, some shales and clays were deposited, reflecting the changing environment. During the Cenozoic (ca. 30 mya), massive blocks of Del Carmen and Santa Elena Limestone were uplifted and tilted along fault lines, resulting in the basin and range morphology seen today: gradual western slopes and steeper escarpments to the east, alternating with alluvial basins in between (Maxwell 1979). DH soils are mostly shallow with a high percentage of rock fragments (mostly calcium carbonate). Rock outcrops are frequent and most slopes are steep. There are small, localized areas on alluvial uplands where the soils are slightly deeper, while deep, loamy soils can be found in some basins and near the Rio Grande. The highest elevations have soil darker in color because of its high organic content and may be moist more often than dry (Cochran & Rives 1985).

Human History and Disturbance Regimes

People were living in the Big Bend area as early as the late Paleo-Indian period (12,000–6500 BC) and there is abundant evidence of habitation in the Dead Horse dating from the Archaic period (6500 BC–ca. 100 AD; Alex 1990). The periphery of the DH was most probably used as a travel corridor throughout history until more permanent settlement occurred in the Historic era (1535 AD– present); after the threat from hostile Indians was removed, ranching and mining activities increased substantially (Tyler 1975).

Human-induced disturbance regimes that have affected DH to a small degree include grazing, natural-resource harvesting of *Euphorbia antisyphilitica* and *Bouteloua ramosa*, infrastructure developments related to cinnabar ore mining, fire, and recreational pursuits such as hiking, camping, and river rafting. However, the

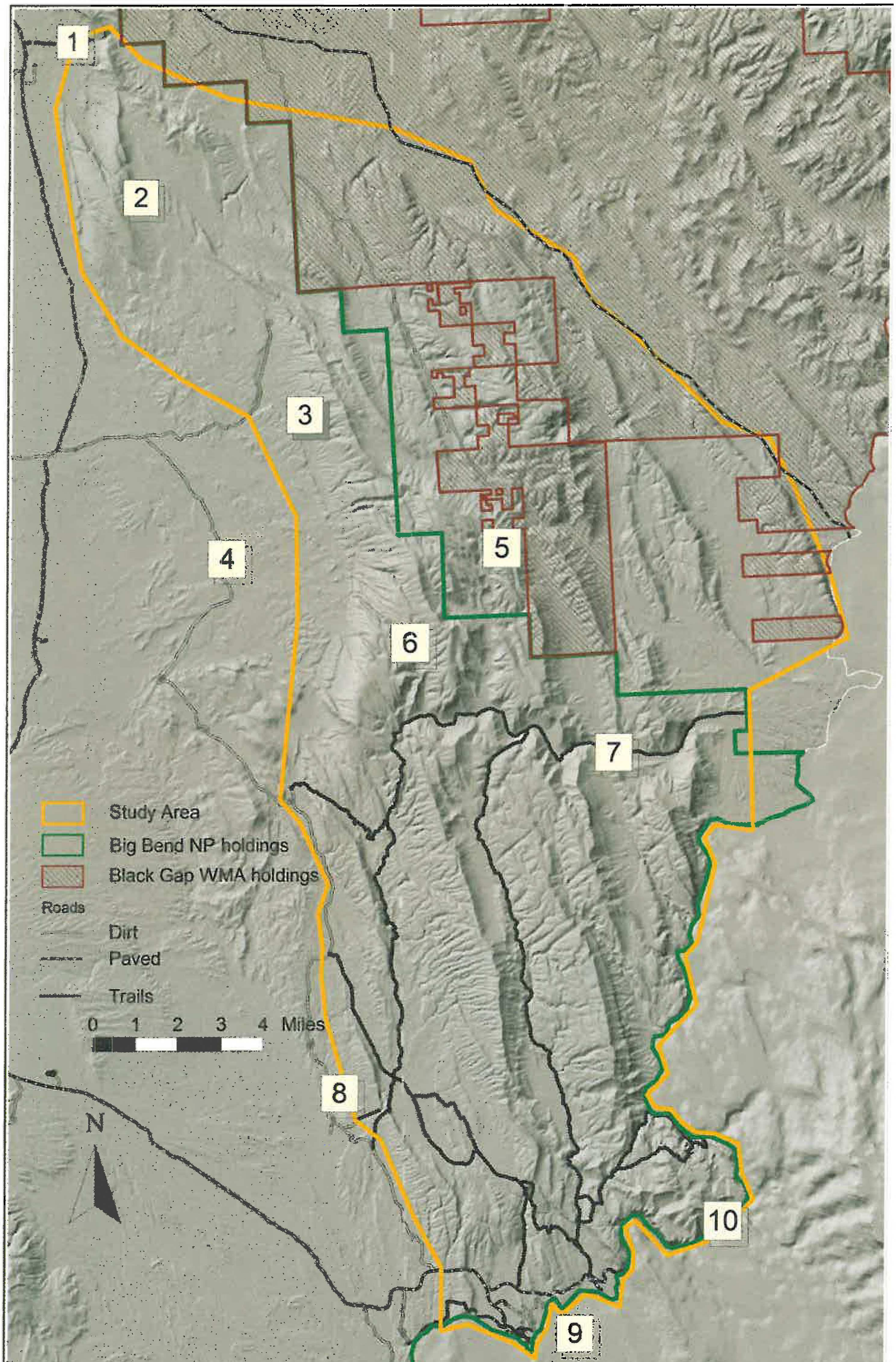


Fig. 3. Dead Horse Mountains study area locations: (1) Dog Canyon, (2) Dagger Mountain, (3) Stuarts Peak, (4) Old Ore Road, (5) Brushy Canyon, (6) Sue Peaks, (7) Telephone Canyon, (8) Ernst Tinaja, (9) RGV, (10) Boquillas Canyon.





Fig. 4a–b. Examples of different vegetation zones within the Dead Horse Mountains study area. A. Mixed Desert Scrub (DSC), lower Telephone Canyon trail area. B. Sotol-Yucca Grassland (SYG), upper Telephone Canyon trail area.

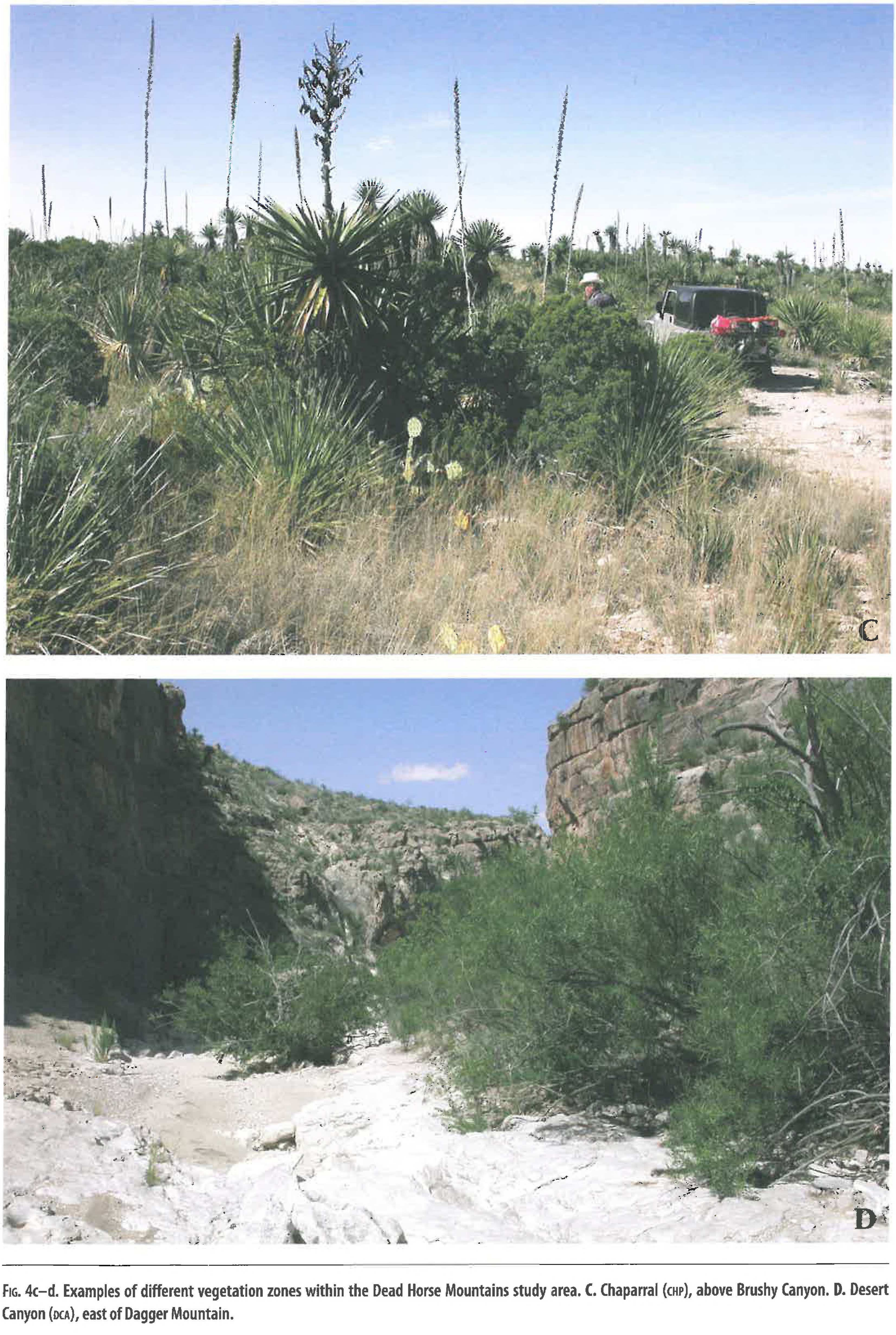


FIG. 4c–d. Examples of different vegetation zones within the Dead Horse Mountains study area. C. Chaparral (CHP), above Brushy Canyon. D. Desert Canyon (DCA), east of Dagger Mountain.





Fig. 4e–f. Examples of different vegetation zones within the Dead Horse Mountains study area. E. Rio Grande Riparian Corridor (RIO), Boquillas Canyon. F. Mixed Desert Scrub and Sotol-Yucca Grassland, Stuarts Peak.



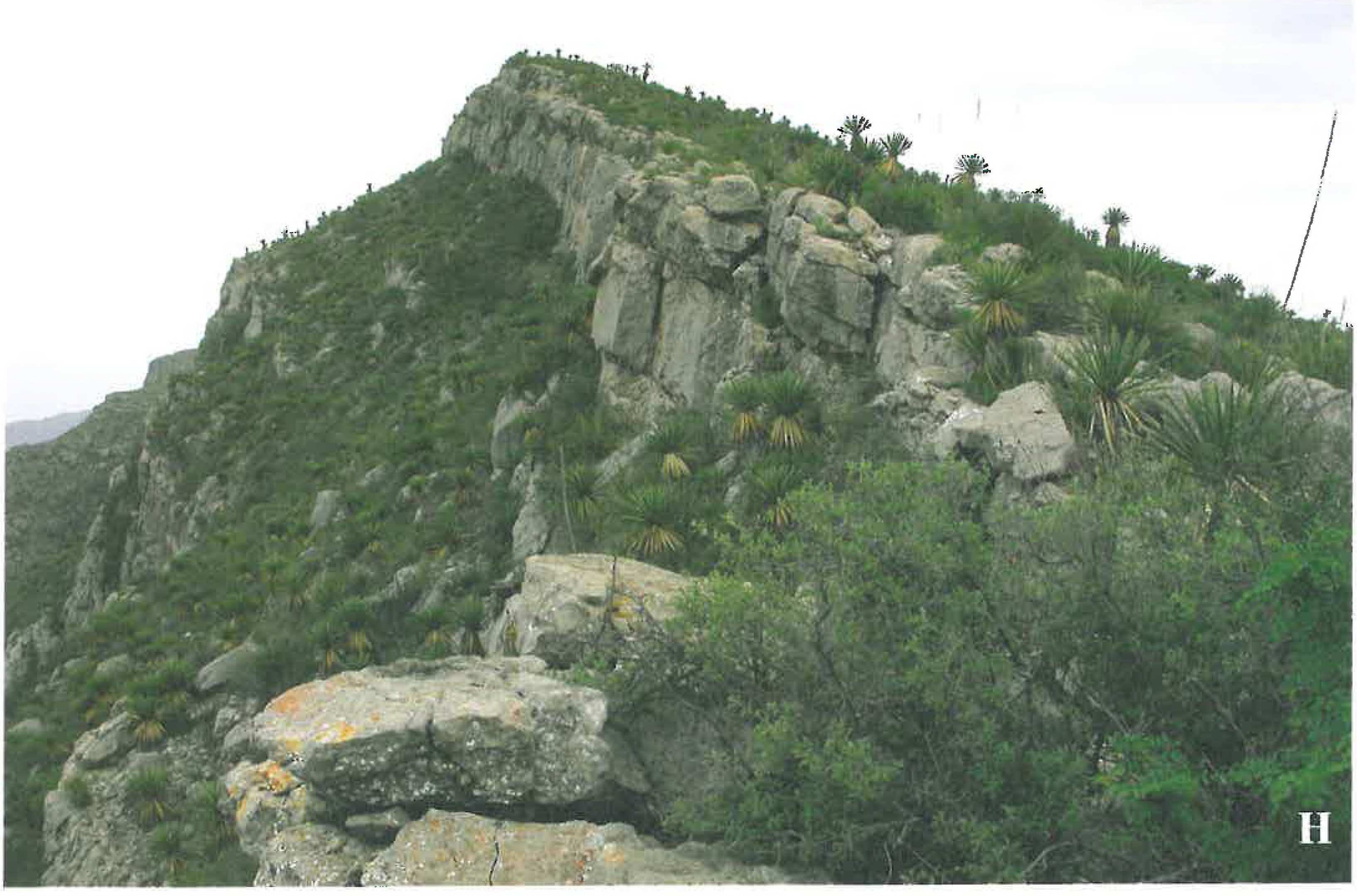


Fig. 4g–h. Examples of different vegetation zones within the Dead Horse Mountains study area. G. Sotol-Yucca Grassland, Sue Peaks. H. Chaparral, Sue Peaks.

most damaging and far-reaching would likely be the increased distribution and dominance of invasive plant species. *Tamarix* spp. and *Arundo donax* have expanded their range along the Rio Grande, creating miles and miles of dense thickets lining the riverbanks. *Pennisetum ciliare* is well established in the lower elevations of BBNP, including the extreme southern end of the study area. However, it is not as dense as it has become in other low-elevation areas, perhaps being held in check by other non-native species, burros and horses. The livestock enter the park from Mexico, trampling vegetation and breaking up biological crusts, increasing the erosion potential in many places along the river corridor.

Fire may be a significant natural factor driving the study area ecology, creating the characteristic patchiness of higher elevation vegetation. Human-caused fires are limited to the developed areas but the interior burns are mainly lightning strikes, burning an individual yucca in more barren rocky areas, but sometimes being carried through drainages or at higher elevations where the biomass is denser. Henrickson and Johnston (1986) suggest that the unique Yucca Woodland community at higher CDR elevations may be maintained by fire, favoring the semi-succulent monocots over more woody species. There has been little suppression effort in the DH, so current states should be considered normal.

General Vegetation Description

Many workers have proposed vegetation classification systems relevant to the region. For the CDR as a whole, there exist excellent overviews of basic and detailed vegetation structure (Morafka 1977; Henrickson & Johnston 1986, 2004; Brown 1994; Powell & Hilsenbeck 1995). Descriptions in several local floras (Rogers 1964; Butterwick & Strong 1976; Amos & Giles 1992; Hardy 1997) demonstrate the degree of local diversity possible within hierarchies created by the above publications. Beyond a large-scale tendency towards homogeneity (Brown 1994), the DH and larger CDR have basic plant-community types that intergrade and change in abundance and dominance in response to the complex physiography. Perhaps Whittaker, as quoted in Takhtajan (1986), has offered the best explanation for general Chihuahuan Desert vegetation patterns: in warm, semi-arid deserts there is no clear convergence of dominant forms as can be found in cool semi-deserts. Warm deserts may be too dry to support arborescent life-forms or consistent canopy cover. However a diversity of non-arborescent growth is supported in pockets of higher moisture availability, maintained by the right combination of aspect, slope, elevation, and substrate. Larger plants, such as shrubs and *Yucca* spp., can also create special microclimates. Many species take advantage of the shade and wind protection that these larger nurse plants provide. This could be considered the canopy of the CDR—low and discontinuous, but functional.

Two vegetation maps, produced through remote sensing and some vegetation sampling, generally include the study area (Plumb 1991, 1992; Wood et al. 1999) but are limited by inadequate sampling and ground-truthing. However they are useful to form an overall impression of the relative importance of cover types. Based on a consolidated version of Plumb's (1991, 1992) vegetation maps, Lechuguilla Scrub covers 50.4% of the study area. This vegetation type includes *Agave lechuguilla*, *Opuntia* spp., *Euphorbia antisyphilitica*, and many species of grasses. Almost equally important in the study area is the High Desert Grassland vegetation at 45.1% coverage, where species like *Nolina erumpens*, *Dasylirion leiophyllum* and *Yucca* spp. are codominant with graminoids.

METHODS

The herbaria of institutions that sponsored botanists known to collect in the Big Bend, in addition to those geographically close to the study area, were contacted and when possible electronically searched: Angelo State University (SAT), the Botanical Research Institute of Texas (BRIT), the New York Botanical Garden (NYBG), Sam Houston State University (SHST), Sul Ross State University (SRSC), the Texas A&M University Biology Department herbarium (TAMU), Texas A&M's Tracy herbarium (TAES), Texas State University (SWT), University of Kansas (KANU), University of Texas at Austin (TEX-LL), the University of Texas at El Paso (UTEP), and Big Bend National Park (BIBE). Sheet-by-sheet searches were conducted at SRSC and BGWMA.

All species found in flower were collected during every trip. Collection of rare species or plants of uncertain identity and/or distribution was guided by BBNP protocol: no more than 10% of the individuals of any viable reproductive population of a rare plant were harvested. Most collecting was done within the National Park, due to easier and quicker access to more areas. Access to the study area was mainly on foot using cross-country navigation but two rough dirt roads and two maintained trails did provide effective access to more interior areas of the range. Two river trips allowed limited southern access. A few extended, overnight trips were enabled by water caches previously transported into the backcountry by NPS trail crew personnel and packstock.

Sampling areas were chosen based on intricacy of topography such as deep and/or sinuous canyons, unvisited but potentially unique areas such as the higher peaks, and otherwise intriguing spots identified on USGS 1:24,000 topographic maps. Search methodology was a directed meander (Goff et al. 1982) at each locality visited, focusing on promising microhabitats and moving from patch to patch as the observable species diversity was documented. Field notes and resulting label data included collection location, habitat, habit, description of notable plant features, relative abundance, and associated species. UTM coordinates were taken on site or approximated post-field using digital elevation model data through ArcView 3.2. Specimens were identified using multiple sources, including Correll and Johnston (1970), Warnock (1970, 1974, 1977), *Flora of North America* Poaceae and Asteraceae volumes (FNA 2003b, 2006, 2007), Powell (1998, 2000), Yarborough and Powell (2002), Turner et al. (2003), and Powell and Weedin (2004). Specimens were determined by B.L. Turner of TEX-LL and A. Michael Powell of SRSC. The atlas of Turner et al. (2003) was the primary source for nomenclature and distributional data, and two online sources (ITIS 2007, MBG 2007) were followed for author information. The *Manual of the Vascular Plants of Texas* (Correll & Johnston 1970) provided the fundamental taxonomic guidelines for this work. However, numerous other sources were utilized for the most up-to-date taxonomic interpretations, most notably Powell (in prep.) and Powell et al. (in ms.) for non-woody vascular species and genera, the *Flora of North America* for Poaceae and Asteraceae treatments (FNA 2003b, 2006, 2007), and Powell and Weedin (2004) for the Cactaceae. Voucher specimens made during this project were deposited at SRSC; selected duplicates were sent to BIBE, TEX-LL, and BRIT.

RESULTS AND DISCUSSION

Between August 2003 and September 2006, a total of 49 days and approximately 400 hours were spent in the field. The 1549 voucher collections made during those three years, plus four observations without vouchers, represent 84 families, 283 genera, and 490 species, totaling 493 taxa at or below the species level. The herbaria search revealed an additional seven families, 58 genera, and 173 species (178 taxa) that were not encountered during the current study. Similarly, the current study documented an additional seven families, 45 genera, and 120 species (121 taxa) beyond the historical baseline found in the herbaria search. Fifty-five of those additional 120 species were new records for the DH, representing a 10% increase in known taxa. Another 65 species (67 taxa), though not previously represented by vouchers, were common and suspected to occur and thus not considered novel records. In sum, the total known flora of the DH to date consists of 91 families, 344 genera, and 662 species (671 total taxa).

The Asteraceae is the most prominent family in the DH, tallying 80 species. Other important families include the Poaceae (75 species), Fabaceae (52 species), Euphorbiaceae (34 species), and Cactaceae (31 species). The eight most species-rich families comprise 50% of the flora while 24 families are represented by a single taxon. The most abundant genera represented in the DH are *Chamaesyce* and *Dalea* at 13 species each.

A taxonomic breakdown of species found in the DH shows that eudicots make up the largest proportion of the flora at 78.9% (Table 1). Gymnosperms comprise the smallest portion of the flora after monocots and the ferns and fern allies. Perennial herbs were the most abundant life form encountered, followed by annual herbs, shrubs, subshrubs, succulents, vines, and trees (Table 2). The annotated list of species found in the DH provides the following information for each taxon: native status, new records, rare species status

TABLE 1. Taxonomic composition of the flora of the Dead Horse Mountains.

Taxonomic group	Families	Genera	Species		Total Species
			Native	Non-native	
Ferns and fern allies	3	7	23	0	23
Gymnosperms	3	3	7	0	7
Monocotyledons	10	57	100	7	107
Eudicotyledons	75	277	508	17	525
Totals	**91**	**345**	**638**	**24**	**662**

TABLE 2. Summary of the Dead Horse Mountain flora by life form (USDA 2007). The semi-succulent members of the Agavaceae, Liliaceae, and Bromeliaceae were included in the shrub category. Eight taxa can be either trees or shrubs depending on the habitat. These were divided equally between the tree and shrub categories. Twenty-eight taxa were listed by USDA as both annual and perennial herbs. These were split evenly between the two herb categories. Graminoid species were included under herbs.

Life Form Species	Number of of Flora	Percent
Trees	27	4.1
Shrubs and semi-succulents	97	14.7
Sub-shrubs	55	8.3
Vines	29	4.4
Annual herbaceous	1	0.2
Perennial herbaceous	24	3.6
Woody	4	0.6
Herbs	420	63.4
Perennial	277	41.8
Annual	143	21.6
Cacti and succulents	34	5.1

and ranking, common name, selected synonyms, relative abundance in the study area, life form, vegetation community, elevation, and all known vouchers.

Herbarium search

It is certain that more DH collections exist in regional herbaria. The collections of one botanist who made significant collections in the BGWMA reside at BRIT, but are not electronically databased. Unfortunately, time and funding constraints precluded a sheet-by-sheet search of that institution for this project. Digital records are a boon to this type of research; however, when in existence they should not be assumed to be complete or entirely accurate. For example, in researching the holdings at SAT, an online search of the Floral Consortium of Texas website revealed 64 vouchers, but an onsite search of SAT's internal digital database resulted in 245 collections, with only three overlapping with the consortium's results. Added to that discrepancy is the fact that not all of the holdings at TEX-LL are included in their online searchable database. Given that that is the main repository in the state, there is a high probability that many DH vouchers were not accounted for through the herbaria search.

Completeness

In the entire history of collection efforts in the study area, including those during the past 15 years, there was a significant rise in species found, without any evident leveling of return for effort. This is to be expected, with much new territory having been covered in more recent years by the Amos survey of Brushy Canyon in addition to the current project. However, the return of new species per year of effort during the course of this study began to taper off and fewer new species were found than remained unseen from the historical

baseline. Some historically collected areas were not revisited, such as the more inland riparian habitats of the Rio Grande Village area, where species may still be extant or perhaps extirpated due to the changing nature of the river corridor. More localized examination of return for effort tells a mixed story: after three visits to the same area of mixed, mid-elevation habitat, there was no reduction of return for effort. However, after two trips to the high-elevation Sue Peaks environment, the return of new species decreased by about 50%. The differences may lie in the types of habitat visited, but one must also keep in mind the vagaries of desert flora—life strategies built around responses to ephemeral rain, general seasonal/temperature restrictions, and even biennial cycles, all serve to limit the flora present at any given time. Certainly more species await documentation in the study area; collections were made throughout most of the Dead Horse range, but some interior locations such as Margaret Basin, the upper Strawhouse trail, the eastern end of Telephone Canyon, and areas interior to Boquillas Canyon remain under collected. Despite this, however, it seems clear that the majority of the flora has been documented.

Vegetation Patterns

Henrickson and Johnston (1986) comment on the high degree of intergradation between vegetation types in the CDR and the difficulty of placing many areas into an exact classification. This can result in many sub-types being recognized, as in their and Plumb's (1992) work. In the DH, six vegetation types are clearly distinguishable, separated generally by elevation and water availability. These types are similar to ones identified by Henrickson and Johnston for the CDR. Other CDR types may have only marginal representation in the DH and are discussed as unique habitat areas. The three dominant types follow elevational zones, with Mixed Desert Scrub (DSC) at lower to mid elevations (Figs. 4a, f), Sotol-Yucca Grassland (SYG) at mid-to-high elevations (Figs. 4b, f, g), and Chaparral (CHP) appearing in patches at the highest elevations within the SYG (Figs. 4c, h). The remaining three vegetation types involve riparian-related areas, including arroyos, canyons, and the Rio Grande corridor. The Sandy Desert Arroyo (DAR) and Desert Canyon (DCA) types interlace with and intersect mainly the lower elevations of DSC but can allow intermixing of higher- and lower-elevation species in steep, protected drainages on mountain slopes (Fig. 4d). The Rio Grande Riparian Corridor (RIO) is the only vegetation type that occurs in association with permanently flowing water and mainly occurs within Boquillas Canyon (Fig. 4e), although the slightly inland, developed areas around RGV have significant riparian habitats that are important to the diversity of the study area. Although few plants are seen throughout the range at all elevations, *Agave lechuguilla* and *Aristida* spp. are possibly the most ubiquitous.

Mixed Desert Scrub.—The DSC vegetation type extends from the lowest elevations to about 4000 ft (1220 m), nearing the higher plateaus of the Dead Horse. The lowest elevations and flattest terrain of the park are dominated by *Larrea tridentata*, which is seen most often on low, foothill approaches and interior basins of the DH. Intermingling at lower elevations are *Opuntia aggeria* and *O. grahamii, Parthenium incanum, Nama hispidum,* and *Acacia neovernicosa. Flourensia cernua* is often cited as being important, even co-dominant, in this ecological zone of the CDR, but it was rarely seen. Moving upslope, various shrubs, succulents, and grasses become more important. Species commonly encountered and expected include: *Tiquilia greggii, Prosopis glandulosa*, *Condalia* sp., *Ziziphus obtusifolia*, *Buddleja marrubiifolia*, *Leucophyllum minus* and *L. candidum, Viguiera stenoloba*, and *Chrysactinia mexicana.* Intergrading with lower-elevation species is *Dasylirion leiophyllum*, which begins to occur as low as 3500 ft (1066 m), but extends to the highest elevations of the range. Dense stands of the rhizomatous *Agave lechuguilla* and *Hectia texensis* occur sporadically and usually include more obvious occurrences of the following common species: *Selaginella lepidophylla*, *Selaginella wrightii*, *Astrolepis* spp., *Argyrochosma microphylla, Calliandra iselyi*, and *Opuntia rufida*. Biological soil crusts of varying degrees of development occur in most inter-rock spaces, harboring various species of cyanobacteria, lichens, and in the right environment even mosses.

Desert Arroyo.—Many of the general DSC species overlap into the dry watercourses intersecting the region; the two xeric-riparian vegetation types are generally distinguishable according to the amount of moisture available. DAR, or Sandy Arroyo Scrub as named by Henrickson and Johnston (1986), occurs in more open, low-elevation drainages incised into the desert flats. The margins are rich with perennial plants, which

often grow into impenetrable thorny thickets across the wash. *Fallugia paradoxa* and *Brickellia laciniata* are commonly present in the wash cobbles of larger drainages, while *Prosopis glandulosa, Guaiacum angustifolium, Forestiera angustifolia, Celtis pallida, Lycium berlandieri,* and *Porophyllum scoparium* are common throughout.

Desert Canyon.—In rockier habitats, larger drainages, and within canyons that provide partial shade, the DCA vegetation type includes additional species such as *Berberis trifoliolata, Fraxinus greggii, Diospyros texana, Eysenhardtia texana, Lippia graveolens, Mimosa* spp., *Acacia roemeriana, Schaefferia cuneifolia, Rhus virens, Tecoma stans, Clematis drummondii, Passiflora tenuiloba*, and *Maurandya antirrhiniflora*. Common wash-associate grasses are *Bothriochloa laguroides, Heteropogon contortus, Setaria leucopila,* and *Aristida* spp. More water-dependent species such as *Ungnadia speciosa* and *Chilopsis linearis* occur infrequently, restricted to the largest drainages.

Juglans microcarpa is not a typical DH species within BBNP; it was seen only once in the National Park at the north end of the range, but as reported by Amos and Giles (1992), it was observed during the current study to be much more dominant in BGWMA's Brushy Canyon. In the same Amos and Giles (1992) report, *Cercis canadensis* var. *mexicana* was listed as a dominant in Brushy Canyon; it was not observed in the National Park portion of the DH. Canyon walls throughout the range provide a relatively consistent but limited habitat for cliff-dwelling species including *Cirsium turneri, Perityle aglossa,* and *Perityle bisetosa* var. *scalaris*.

Rio Grande Riparian Corridor.—A more traditional riparian woodland vegetation type exists only along the Rio Grande, where the consistent water table can support native species such as *Populus fremontii, Salix* spp., *Baccharis salicifolia, Phragmites australis*, and the introduced and invasive *Arundo donax* and *Tamarix* spp. A few solitary individuals of more water-dependent genera (e.g., *Salix*, *Baccharis*, and *Tamarix*) occur in at least one other place in the DH interior: above Ernst Tinaja, where their water-hungry roots may have found a perched water table. Also important along the Rio Grande are *Acacia farnesiana, Nicotiana glauca, Prosopis glandulosa*, and *Chilopsis linearis*.

The major, non-native species have altered and will continue to alter the riparian landscape. Thickets of cane with abundantly dense rhizomes have solidified the river banks, channelizing the watercourse. This creates, in many cases, an irreversible cycle: the channel concentrates the river flow, which increases its velocity and thus erosive power, which, in turn, creates a deeper channel that does not allow flooding over its banks as easily as before. With over-bank flooding decreased due to channelization and a generally reduced flow/flood cycle due to upstream dams, dense canopies of *Arundo donax* and *Tamarix* spp. are allowed to establish, precluding the formation of native *Salix* spp. and *Populus* spp. bosques (Howe & Knopf 1991, Bell 1997).

Sotol-Yucca Grassland.—Found on the higher elevation slopes and plateaus to the highest peaks, SYG is the dominant vegetation above DSC. The vegetational boundary seems to occur, at least on the western side of the range, at around 5000 ft (1524 m), where the steep western slopes top out to form a main central plateau within the DH range. Stuarts Peak, though slightly lower at 4800 ft (1463 m), should also be included, due to its many unique floristic characteristics, including a diverse lichen flora and, in the DH, the only known populations of two species that are more expected in montane forested vegetation—*Philadelphus microphyllus* and *Achnatherum curvifolium*.

SYG is a visually distinct zone where large yuccas and sotol stand out from the shrub- and grass-dominated understory. Also known as Izotal, Sotolal, and Rosetófilo, this vegetation type is considered by some to be shrub-dominant (e.g., Henrickson & Johnston 1986), and so the term "grassland" is omitted in their official terminology. The DH do seem to have a persistent shrub component dominated by *Dasylirion leiophyllum*, *Nolina erumpens*, and *Yucca* spp., even as the grass diversity and abundance increase with elevation. However, the two life-forms seem to be codominant and the term "grassland" is used here to convey the importance of bunch grasses in the inter-shrub spaces. On the main DH plateau, *Nolina erumpens* becomes a significant, visual member of the SYG creating, along with the *Dasylirion leiophyllum*, large masses of thick vegetation, standing in some places almost head high.

Common plants associated with the SYG of the DH include *Yucca torreyi, Yucca thompsoniana, Nolina erumpens, Fouquieria splendens, Parthenium argentatum, Bouchea spathulata, Leucophyllum* spp., *Bernardia obovata, Vauquelinia angustifolia, Mortonia scabrella, Zinnia acerosa, Coryphantha tuberculosa* var. *tuberculosa, Coryphantha echinus, Neolloydia conoidea, Epithelantha macromeris, Bouteloua curtipendula, Aristida* spp., *Enneapogon desvauxii, Leptochloa dubia,* and *Muhlenbergia tenuifolia.*

True grasslands, though included in reviews of CDR vegetation types, are not functionally a part of the DH environment. Areas that are clearly dominated by graminoids without a significant shrub component are more commonly associated with the higher plains around the towns of Marathon, Alpine, and Marfa in the northern Big Bend. In the DH, grasses are important components of the shrubby slopes and higher plateaus, and at higher elevations, a few species that are important components of the vast grama grasslands to the north do occur. However, small areas dominated by grasses occur only on the scale of remnant patches rather than functional ecosystems; they are not dense or contiguous enough, nor dominated enough by the typical grassland species *Bouteloua eriopoda* and *Bouteloua gracilis*, to be considered a true grassland. This seems to follow a general trend of grama grasslands' being established on igneous soils, whereas limestone substrates in similar conditions will support only desert-scrub assemblages (Henrickson & Johnston 1986).

Chaparral.—Small pockets of shrub thickets, or CHP, occur within the SYG on plateaus and eastern slopes associated with the high elevations of the Sue Peaks area. Small and sometimes dense clumps of *Quercus pungens,* some *Quercus mohriana* and *Quercus grisea, Cercocarpus glaberoides, Berberis trifoliolata* and *Rhus virens* associate with large *Dasylirion leiophyllum* and *Nolina erumpens,* all overtopped by the occasional but conspicuous *Yucca faxoniana.* Expected but less frequently seen species include *Fraxinus greggii, Garrya ovata, Ptelea trifoliolata,* and *Muhlenbergia parviglumis.* Oaks and other more mesic species occur also at the highest summits and in more protected parts of drainages, even in steep drainages and lower elevations of the western slopes. These micro-niche species include *Malacomeles denticulata, Quercus pungens, Fendlera falcata, Fraxinus greggii, Prunus havardii,* and *Cheilanthes* spp.

Junipers, including *Juniperus coahuilensis* and *Juniperus pinchotii*, occur sporadically on the high plateaus amongst the chaparral clumps and, very rarely, in large, lower-elevation canyons. Pinyon pines are rare, documented only at a few eastern-slope locations. These species are probably relicts from the previously extensive juniper-pinyon-oak woodland covering the region between 22,000 and 11,000 years ago. The main pine of the DH is *Pinus remota*, a limestone specialist (Powell 1998). Once more widespread, *Pinus remota* in the Trans-Pecos is limited to isolated pockets, being more abundant on the Edwards Plateau and in Mexico. Records of *Pinus cembroides* in the DH are unusual; it is a higher-elevation taxon, although the two species are known to occur together elsewhere in the Big Bend region (Powell 1998).

Unique Habitats.—Several unique habitats were encountered during the course of the study; only the sand dunes at the mouth of Boquillas Canyon have been explored rather thoroughly. Though not extensive enough to support a full representation of Henrickson and Johnston's (1986) Sand Dune Scrub vegetation type, they have been well botanized and do provide a unique habitat for a few species including the rare *Chamaesyce golondrina* and the sand-loving species *Heliotropium convolvulaceum*, *Corispermum americanum*, and *Dalea terminalis*. Several other unusual vegetative areas would no doubt profit from further examination.

An isolated bottomland of *Pleuraphis mutica* covers the western edge of Ernst Basin, in stark contrast to the sparsely vegetated, more elevated flats over the rest of the basin. This tobosa grassland area may represent a small inclusion of Tornillo soils, which was previously unknown in the DH and is interesting not only because *Pleuraphis mutica* occurs in distinctly limited areas of BBNP, but because several other species were collected only there: *Malvella leprosa*, *Leptochloa panicea*, *Chamaesyce serpens,* and the Texas endemic *Lycium puberulum* var. *berberioides*. The possibility of similar habitats, i.e., the existence of Tornillo soils, in other large basins in the DH should be explored, in particular at the northern end of the Ore Terminal trail, in Margaret Basin, and along the Strawhouse trail.

The vegetation in a high saddle (5300 ft, 1615 m) just north and west of Sue Peaks was completely different from the immediate, Rosetófilo-type surrounding community. The soil was finer, deeper, and less

rocky than the surroundings; old wire, pieces of wood, and prehistoric lithic scatter including point bases and partial tools was found on the ground surface. Many plant species found there are reminiscent of the tobosa grassland area north of the Rosillos Mountains in the Harte Ranch area of BBNP, *Pleuraphis mutica*, *Panicum obtusum*, and *Hoffmannseggia drepanocarpa* in particular. Other species making up the unique community included *Sporobolus airoides*, *Sporobolus cryptandrus*, *Aristida adscensionis*, and *Muhlenbergia arenicola*.

The other habitats deserving of more attention are at the highest elevations, especially Sue Peaks and Stuarts Peak. Each has different characteristics making them interesting. Stuarts Peak is a rather narrow ridge, with not much area forming the actual summit. However, many plants collected there were surprising to find in such a seemingly arid location, including *Achnatherum curvifolium* and *Philadelphus microphyllus*. The lichen and moss flora on the summit ridge was impressive in its diversity, which was not observed to the same extent anywhere else in the study area. Also notable was that the summit ridge was one of the few places encountered where the cactus *Neolloydia conoidea* was growing densely enough as to preclude non-damaging travel.

The Sue Peaks area exhibits a well developed CHP community with shrub oaks being very common in the whole DH plateau area. The peaks themselves are rather bare of large shrubs, those being relegated to niches between boulders and ledges. Several species, found only in this area, were observed and collected on a trip following significant rains in the area: *Phemeranthus brevicaulis*, *Ipomoea costellata*, *Nama dichotomum*, *Dichromanthus cinnabarinus*, and *Mirabilis linearis*. These species, in addition to others known only from the peaks or the surrounding area including *Asplenium resiliens*, *Asclepias sperryi*, *Quercus mohriana*, *Fraxinus cuspidata*, *Quercus laceyi*, and *Pinus remota*, indicate that conditions on the whole are relatively mesic and that under favorable conditions, additional unique species may be in evidence.

Non-natives, Range Extensions, Rare Taxa, Notable Collections

Non-native species constitute a small part of the DH flora. The USDA considers 24 species collected in the DH as exotic (USDA 2007). Six of those species are considered invasive, and three are state-listed noxious weeds: *Arundo donax*, *Tamarix aphylla*, and *Tamarix chinensis* (PTI 2006). Significantly, *Pennisetum ciliare*, an introduced grass from Africa, is not among the Texas-listed invasives; however, it is a demonstrated threat to native ecosystems throughout the southwest (e.g., TNC 2005) and is listed by the state of Arizona as a noxious weed (AZDA 2005). The fact that it is widely planted in Texas and northern Mexico as a range grass perhaps makes its listing unlikely. *Eragrostis lehmanniana* is a well-known invasive in the desert southwest, but its presence in the study area appeared to be minimal outside of the river corridor. It seems to require more moisture than is reliably present in the majority of the range, with isolated plants being found near an old header dam and in shady or sandy areas of large drainages. Overall, non-native species constitute 3.6% of the DH flora.

Eleven species found in the DH are endemic to Texas, according to the Texas A&M Bioinformatics Working Group and updated taxonomic and distribution information (TAM-BWG 2006). The occurrence of *Matelea sagittifolia* in Brewster County is not currently reflected on the referenced website, but it was collected during the present study and also during a recent survey of the Lone Mountain area of BBNP (Fenstermacher et al. 2006). *Lycium puberulum* var. *berberioides* is also not listed by the Bioinformatics Working Group as occurring in the county but should be; it has been a known member of the BBNP flora for some time (Powell 1998). *Hedyotis pooleana*, though included in this DH-endemics list, is another species not listed by the Bioinformatics Working Group, perhaps due to the lack of consensus over its taxonomy (Turner 1995, 1997; Terrell 1996, 2001). Endemic species account for 1.7% of the DH flora.

Many noteworthy collections were made during the study period. The Wildlife Diversity Program of TPWD, in conjunction with the Texas Conservation Data Center of the Nature Conservancy of Texas, tracks seventeen rare species that were collected in the DH (TPWD 2006). Several of these species were collected at new locations. *Bouteloua kayi* was previously known only from one location east of the DH but it was found to be one of the dominant grasses at higher elevations near Sue Peaks. In the mid 1980s, *Hedyotis pooleana* was first collected at one locality in the DH and named as a new species. Subsequently it was not seen until the

present study during which it was found throughout the majority of the range in higher-elevation bedrock exposures.

Andrachne arida was last collected in the DH in the 1960s, and during the study period it was relocated in the general vicinity of the historical collections. One small population of the diminutive legume *Senna ripleyana* was discovered, clarifying its status as having remained extant north of the international border since its last documented collection in northern Brewster County in the 1940s. Another historically collected taxon *Sedum nanifolium* was encountered in shallow soil pockets on the DH plateau. Regionally it was previously known from one collection in the limestone mountains of northern Brewster County (Warnock 1977) and has been recently observed on hilltops of the Cox and Guadalupe ranches, about 15 mi (24 km) west of Sanderson (M. Terry pers. observ.).

One taxon, a member of the genus *Galactia*, as yet is not identified to the specific level. It does not fit descriptions of known Texan taxa (B. Turner pers. comm.) and awaits review when appropriate herbarium specimens become available. Populations have been found in several southern DH locations and the plant was encountered more commonly near the Rio Grande within side drainages of Boquillas Canyon. It is a sprawling, procumbent perennial from a central taproot, often growing vine-like within larger, surrounding vegetation. It has dense, silvery pubescence on all vegetative parts but is more pronounced on the leaves, those having prominent under-surface veins. The flowers are pink, the banner exhibits a green-yellow base, and the petals turn a deep blue-purple upon dessication.

New to the United States, the Mexican taxon *Seymeria falcata* var. *falcata* was collected north of the border originally in 1994 (*MT 137* SRSC), but it was not recognized as such until collections for the current study spurred a review of previous collections of its more widespread relative *Seymeria scabra* (Fenstermacher 2006).

Eight species were newly recorded for Brewster County, according to Turner et al. (2003) and known herbarium specimens: *Achnatherum curvifolium, Atriplex rosea, Argemone mexicana, Hedeoma serpyllifolia, Matelea sagittifolia, Maurandya wislizeni, Nama dichotomum,* and *Rumex maritimus*. Three of these species, *Atriplex rosea*, *Argemone mexicana*, and *Maurandya wislizeni*, were collected by NPS staff in conjunction with the restoration site at the mouth of Boquillas Canyon.

Many of the newly collected species for the DH are taxa that normally occur in much less arid conditions at the highest elevations in the Trans-Pecos. *Achnatherum curvifolium* is a C3 grass previously known from a restricted range in the Guadalupe Mountains of Texas and New Mexico (Powell 2000), and the nearby Delaware Mountains (*Worthington 24663* SRSC). *Nama dichotomum* is another elevation-restricted species, previously known from the Franklin, Davis, and Guadalupe Mountains. Its distribution ranges from Colorado down through the Mexican highlands and into temperate South America (Correll and Johnston 1970; Turner et al. 2003). In addition to the sparsely occurring relict taxa of *Juniperus* and *Pinus*, several other species were found whose presence was not expected in such relatively arid conditions: *Philadelphus microphyllus*, and several other C3 grasses *Achnatherum eminens*, *Achnatherum lobatum*, *Hesperostipa neomexicana*, and *Melica montezumae*. The DH are virtually the only area in the park where the giant dagger, *Yucca faxoniana*, occurs.

Interesting observations were made of dog cholla (*Opuntia* spp.) populations from the southern end of the study area. Dog cholla species of the southern Big Bend, most as part of the *Opuntia schottii* complex, have been of taxonomic interest for some time (Anthony 1956). The most recent attention in the literature documented that a long-believed hybrid, purportedly a cross between the tetraploids *Opuntia grahamii* and *O. schottii*, was finally determined to be a distinct species, *Opuntia aggeria*, based on morphology and its diploid nature (Ralston 1987, Ralston and Hilsenbeck 1989). During the current study, however, several observations and collections provide impetus for a fresh look a the taxonomy of southern Big Bend dog cholla: (1) a triploid hybrid was documented in the Ernst Tinaja area (*JF 635* SRSU; parents undetermined); (2) Diploid individuals with widely varying morphologies (e.g., *Fenstermacher 640, 1574* SRSC) may indicate that *Opuntia aggeria* has an even broader species concept than previously described by Ralston and Hilsenbeck (1989); (3) a tetraploid cholla was documented at Ernst Tinaja (*Fenstermacher 691* BIBE) with morphology

dissimilar to both *Opuntia schottii* and *O. grahamii,* possibly suggesting a larger distribution of *Opuntia densispina* in the Big Bend than previously surmised (Ralston and Hilsenbeck 1992, Powell and Weedin 2004); (4) all collections and individuals examined of *Opuntia grahamii* were sterile, effectively producing no pollen (J. Fenstermacher unpub. data). These findings suggest that the taxonomy of the *Opuntia schottii* complex is not completely understood; more data from Mexican populations may allow further resolution of the problem.

Floristic Analysis and Phytogeographic Connections

As a portion of Big Bend National Park, the flora of the DH is 54% of the park's listed total (NPS 1996) yet is found only on 24% of the land area. Clearly, this eastern side of the national park with its riverine and high-elevation habitats is an important source of area diversity. Comparisons with regional floras are hampered by their mostly out-of-date checklists, but exploring relationships to peripheral floristic areas and the larger southwest region is possible. One of clearest results of analyzing the DH flora is that while the Asteraceae is the most dominant family of the Southwestern flora (McLaughlin 1986), the Poaceae is co-dominant with Asteraceae in the DH and other southern Big Bend floras (Fenstermacher 2007). This suggests the connection to the Great Plains grasslands, moving into Texas through the High and Rolling Plains vegetation zones of the Panhandle region. The connection has also been quantitatively demonstrated by Christie (2006).

The Fabaceae is also important in the Southwest, but more important locally in the DH. This family comprises a larger percentage of the species of the SW flora than in the DH, yet the DH have more fabaceous species (52) than the average for SW floras (28). In fact, only five DH genera make the Southwestern flora's top-twenty list, and they do not include *Dalea*, one of the two dominant genera of the DH. The local importance of the Fabaceae, in addition to the many other resident thornscrub species like *Aloysia gratissima*, *Ziziphus obtusifolia*, and *Leucophyllum* spp., may indicate the importance of the Tamaulipan Thornscrub flora (WWF 2001). Indeed, for the few Trans-Pecos individuals of the more Tamaulipan species, *Acacia berlandieri, Croton torreyi,* and *Karwinskia humboltiana*, the Rio Grande corridor has most likely provided a conduit of limited habitat that enabled these species to extend their distributions upriver into generally more arid surroundings.

These connections to peripheral vegetational areas suggest that the CDR, and by extension the DH, are not simple extensions of the Sonoran region, as Cronquist suggests (1982). Rzedowski (1973) notes that both desert areas have several endemic genera (21 Sonoran, 16 CDR), which could suggest a long period of isolation and autochthonous development. In the same paper, comparisons of similarity index analyses show that the CDR flora has more affinity to the southern end of the Sierra Madre Oriental than it does to the Baja/Sonoran flora. Perhaps because there do not seem to be distinctive topographic limits to northern vegetative expansion, the limits of the CDR may be more climatically controlled (McLaughlin 1989): CDR flora shows more similarity to coastal Peru than to the Great Basin (Rzedowski 1973). Climate as a limiting factor becomes more significant when realizing that the Great Basin, Sonoran, and Chihuahuan deserts are linked topographically and geologically as members of the Basin and Range province.

Individual species' tolerances are probably what drove the paleovegetational changes in response to the changing climate. However, as McLaughlin (1986) points out, that is no reason why, on a larger scale, there cannot be found coherent assemblages of species occurring in non-random patterns. Many floristic regions, delineated as places where the climate acts upon the vegetation (as opposed to more local vegetational areas, using delimiters like soils or geography), have been applied to the Southwest (Dice 1943; Cronquist 1982; Takhtajan 1986; McLaughlin 1986; Bailey 1998). The boundaries of these large-scale, ecological regions can be drawn strictly using climate and gross vegetational features (Bailey 1998), by using centers of endemism to create distinct groupings (Cronquist 1982; Takhtajan 1986), which could be called a "scarceness" model, or the focus could be on the degree of overlap between individual floras throughout a region (McLaughlin 1986, 1989). This latter model does not focus on the dominant or rare taxa; rather, it takes into account all extant species and is a method based on "commonness." To this end, McLaughlin's (1986, 1989) work has provided floristically-based evidence supporting many historical floristic distinctions, intuitive or otherwise.

Interestingly, the area of southeast Arizona and southwest New Mexico, where Henrickson and John-

ston (2004) draw an arbitrary border of the CDR because of its perceived transitional nature, is shown by McLaughlin (1989) to be part of a distinct floristic area originally intuitively recognized by Dice (1943). McLaughlin's (1989) similarity indices identified an outlying connection between his so-called "Apachian" flora and the Davis Mountains region of the Big Bend, which Turner (1959) actually suggested in his floristic interpretation of the area. Also in support of this connection, the Davis Mountains, based on a subset of its flora (Larke 1989), has a family profile more similar to that of the Southwest (McLaughlin 1989), and is located more closely to the core of the Apachian element than to floras in the southern Big Bend.

The Apachian floristic element is thought to be autochthonous but allied to the Sierra Madre Occidental (McLaughlin 1989). Perhaps during the expansions and contractions of vegetation communities in response to Pleistocene climate change, this Apachian center extended its influence into the Big Bend. As many as 25 glacial-interglacial periods have affected the southwest (Henrickson & Johnston 2004), allowing more temperate plant species to expand into the Big Bend region from both the north and the south. In the Chisos Mountains of BBNP, *Pseudotsuga menziesii* and *Populus tremuloides* occur with the Mexican montane species *Cupressus arizonica* and what is believed to be *Pinus arizonica* (Powell 1998). In the DH, cooler-climate species that may be remnants of glacial expansion include *Achnatherum curvifolium* from the north and the Mexican pinyons from the south. In warmer times, the desert scrub and more tropical species expanded from the south. These climate fluctuations could have allowed for speciation through isolation, but there would have been more opportunities for diversification in the southern CDR, away from more extreme climate changes coming from the continental interior (Van Devender 1986). Of course, any discussion of speciation must acknowledge that the process is not simply a function of time or climate. Life forms, breeding systems, and genetics are also critical in producing differential speciation abilities (Grant 1958). However, perhaps more influential than genetic isolation, extinction may have been a more effective mechanism than speciation in affecting today's floristic diversity in the Big Bend.

More floristic study is warranted for the region. Beyond simply improving baseline knowledge of the Trans-Pecos flora, previous floristic work (McLaughlin 1986, 1989) should be revisited and improved by updating the original data, since the size of several Trans-Pecos floras have increased by 40–50% since the 1980s (e.g., Warnock 1967 *in* McLaughlin 1986 and Worthington 2001). Regionally, similarity index studies similar to those by McLaughlin (1986, 1989, 2007) and especially Christie (2006) could be used to elucidate in more detail the floristic influences on the Big Bend region and might help to identify more concretely the distinctions among CDR provinces. In this context, the completion of the present Dead Horse Mountains flora constitutes a significant step towards a more complete understanding of West Texas and regional floristic relationships.

ANNOTATED CHECKLIST OF VASCULAR PLANT TAXA

Species are arranged by divisions following Raven et al. (2003): Lycophyta, Pteridophyta, Coniferophyta, Gnetophyta, and Anthophyta. The flowering plants are subdivided into the classes Monocotyledones and Eudicotyledones. Within these hierarchical groupings, taxa are listed alphabetically by family, genus, species, and infraspecific rank as appropriate. Beyond a basic reliance on the *Manual of Vascular Plants of Texas* (Correll & Johnston 1970), taxonomy and nomenclature were taken preferentially from several updated sources, including Powell (in prep.) and Powell et al. (in ms.) for non-woody vascular species and genera, the *Flora of North America* volumes for the Poaceae and Asteraceae (FNA 2003b, 2006, 2007), and Powell and Weedin (2004) for the Cactaceae.

Online databases were consulted for currency, authors, and synonomy (ITIS 2007; MBG 2007; USDA 2007). Turner et al. (2003) was the fundamental source for nomenclature and distributional data. Specimens found through the herbaria search were assumed to be correctly identified except those that according to Turner et al. (2003) would have been far outside of their normal range. These were requested on loan, examined, and included or excluded from the final flora based on the resulting determinations (Fenstermacher2007). Native status, com (USDA 2007). Locally used common names from regional literature were included if not utilized by the USDA.

TABLE 3. Index to workers (initials and collectors name) who have made collections in the study area.

ACK	A.C. Koelling	DM	D. Miller	JM	J. Masters	RE	R. Eckhardt
AD	A. Denyas	DS	D. Seigler	JMM	J.M. Miller	RH	R. Halfmann
AG	A. Grimes	DS2	D. Smith	JMP	J.M. Poole	RLH	R.L. Hartman
AL	A. Freeman/A. Leavitt	DSC	D.S. Correll	JS	J. Sirotnak	RLU	R.L. Ufkes
AL2	A. Lewis	ECM	E. Castro-Mendoza	JT	J. Todd	RN	R. Nichols
AMP	A.M. Powell	EGM	E.G. Marsh	KJC	K.J. Castro	RRI	R. Rose-Innes
AT	A. Traverse	EJL	E.J. Lott	LCH	L.C. Hinckley	RS	R. Studhalter
B	Blevins	EW	Eula Whitehouse	LEB	L.E. Brown	SJ	S. Jones
BA	B. Alex	GJG	G.J. Goodman	LF	L. Fowle	SMU	SMU-DMNH
BA2	B. Amos	GJ	G. Jones	LJT	L.J. Toolin	SAP	S.A. Powell
BAR	B.A. Ralston	GLB	G.L. Bradley	LS	L. Slauson	SS	S. Sikes
BCT	B.C. Tharp	GLW	G.L. Webster	MA	M. Anthony	TA	T. Anderson
BD	B. Dodson	HBC	H.B. Correll	MC	M. Cole	TE	T. Emerson
BDGL	B.D.G. Leopold	HBP	H.B. Parks	MCJ	M.C. Johnston	TJW	T.J. Watson
BGH	B.G. Hughes	HC	H. Croad	MD	M. Darrach	TK	Tony Klein
BHW	B.H. Warnock	HCC	H.C. Cutler	MLP	M.L. Powell	TM	T. Mollhagen
BLT	B.L. Turner	HCH	H.C. Hanson	MPG	M.P. Griffith	TR	T. Rogers
BM	B. Moon	HKB	H.K. Beuchner	MSY	M.S. Young	TRV	T.R. Van Devender
BPM	Billy Pat McKinney	HL	Hillary Loring	MT	M. Talbot	TXDOT	Tx Highway Dept.
BR	B. Rector	HTF	H.T. Fletcher	MT2	M. Turner	UTW	U.T. Waterfall
BRM	B.R. McKinney	IMJ	I.M. Johnston	MWB	M.W. Bierner	VB	V. Bailey
CA	C. Adkins	JAM	J.A. Moore	MY	M. Yuhas	VLC	V.L. Cory
CAB	C.A. Bane	JAS	J.A. Steyermark	OCW	O.C. Wallmo	WBM	W.B. McDougall
CMR	C.M. Rowell	JC	J. Clark	OES	O.E. Sperry	WEH	W.E. Hall
CN	C. Newman	JDA	J.D. Allen	PAS	P.A. Smith	WFB	W.F. Barr
DAL	D.A. Louie	JDB	J.D. Bacon	PC	P. Cruze	WFM	W.F. Mahler
DAZ	D.A. Zimmerman	JEA	J.E. Averett	PDW	P.D. Whitson	WGD	W.G. Degenhardt
DB	D. Baker	JF	J. Fenstermacher	PM	P. Manning	WH	W. Hodgson
DB2	D. Benham	JFW	J.F. Weedin	PM2	P. McNeal	WOD	Justice W.O. Douglas
DF	D. Flyr	JH	J. Hardy	PVW	P.V. Wells	WRC	W.R. Carr
DG	D. Giles	JJ	J. Jernigan	RAH	R.A. Hilsenbeck		
DHR	D.H. Riskind	JLB	J.L. Blassingame	RB	R. Baker		

Various symbols precede the species entries: * = non-native; ! = invasive non-native; !! = noxious non-native (PTI 2006); **Δ** = observed but not collected; § = previously collected, but not during the current study period; **+** = first voucher of a common or expected taxon; # = newly documented taxon for the DH; ○ = species is shown to occur in the study area in Turner et al. (2003) but no voucher was found during the herbarium search; ● = species is not shown to occur in study area in Turner et al. (2003) but previous voucher was discovered during herbarium search; ♦ = new county record; *species name* = new park record; **bold type** = rare (TPWD 2007). An explanation of rankings for rare species can be found in Poole et al. (2007). Abundance categories were based on Palmer et al. (1995) and ranked as follows: abundant = dominant or co-dominant in one or more common habitats; common = easily seen or found in one or more common habitats but not dominant in any common habitat; occasional = widely scattered but not difficult to find; uncommon = difficult to find with few individuals or colonies but found in several locations; rare = very difficult to find and limited to one or very few locations or uncommon habitats. Any historical abundance observations taken from label data are placed within quotations. The terms used historically were not changed (e.g., from "infrequent" to "uncommon"), because the previous collector's frame of reference or personal distinctions of scale categories is unknown. Many species may have a "rare" abundance within the study area but are not tracked by TPWD or TNC as being imperiled state- or worldwide and, thus, are not listed in bold and do not have a G or S ranking.

Vegetation communities: DSC = Desert Scrub; DAR = Desert Arroyo; DCA = Desert Canyon; RIO = Rio Grande Riparian Corridor; SYG = Sotol-Yucca Grassland; CHP = Chaparral. Two vegetation communities listed

together (e.g., SYG/CHP) indicate that the species was found in an intermediate matrix of vegetation types. More detailed habitat/substrate information, specific collection localities, and other notes are included in the MS thesis manuscript (Fenstermacher 2007).

All collections made during the current study are housed at SRSC. Selected duplicates were sent to BIBE, TEX-LL, and BRIT. All collections in the annotated list are grouped by the responsible herbarium. One hundred and sixteen collectors have contributed to the flora of the DH; initials were used for the names taken from the databases and are listed alphabetically by the first letter (Table 3).

LYCOPODIOPHYTA

Selaginellaceae

Selaginella lepidophylla (Hook. & Grev.) Spring, Resurrection fern, common perennial, DSC, DCA, SYG, 2200–4200 ft; *BA2 5391, JLB 3973, MC 158* (SAT); *BHW 18407, 10760, BHW & MCJ 15988, JF 253, MT 99, 420* (SRSC); *BHW 10760, BHW & RRI 562, DSC & BHW 14980, RRI & BM 1316a* (TEX-LL).

§ *Selaginella pilifera* A. Braun, Resurrection plant, perennial; *JLB 3980* (SAT).

Selaginella wrightii Hieron., Wright spikemoss, occasional to common perennial, DSC, DCA, SYG, 3500–4000 ft; *WFM 43* (BGWMA); *JF 458, 912, BHW 10827 & 18409, BHW & MCJ 15985* (SRSC); *BHW 10827, DSC & BHW 14981* (TEX-LL).

PTERIDOPHYTA

Aspleniaceae

+o *Asplenium resiliens* Kunze, Blackstem spleenwort, rare perennial, SYG, CHP, 5680–5840 ft; *JF 1279, 1993* (SRSC).

Pteridaceae

Argyrochosma limitanea (Maxon) Windham ssp. *mexicana* (Maxon) Windham, Southwestern false cloakfern, uncommon perennial herb, DCA, SYG, CHP, 2120–5840 ft; *JF 270, 432, 529, 675, 1504, 2023, 2198; AMP & SAP 6142* (SRSC).

Argyrochosma microphylla (Mett. ex Kuhn) Windham, Small leaf false cloakfern, occasional perennial, DSC, SYG, CHP, 2780–5000 ft; *JLB 2957, BA2 5392* (SAT); *JF 183, 484, 527, 768, 1175, 1198, BHW 10822* (SRSC), *BHW 10822, BHW & LCH BG-143* (TEX-LL).

Astrolepis cochisensis (Goodding) Benham & Windham, Cochise scaly cloakfern, common perennial, DSC, DCA, SYG, CHP, 1800–5500 ft; *WFM 58, BHW & LCH s.n.* (BGWMA); *PVW s.n.* (KANU); *JF 305, 953, 1232, 1257, 1546, 2098a, JF & MD 462, AMP & SAP 6143a, 6160, MT 54, BHW 10829, BHW & LCH BG-131, BHW & MCJ 16861* (SRSC); *BHW 10829* (TEX-LL).

Astrolepis integerrima (Hook.) Benham & Windham, Hybrid cloakfern, common perennial, DSC, SYG, 1900–4320 ft; *BA2 5393, 5578, 5579, JLB 938, 2599, HC 1, 32, 34* (SAT); *JF 206a, 433, 487, 680, 952, 1054, 1138, 1489, 1496, 1547, 2043, AMP & SAP 6143b, 6161, TR 88, 464, MT 55, BHW & MCJ 16068;* (SRSC); *DSC & BHW 14982a* (TEX-LL).

Astrolepis sinuata (Lag. ex Sw.) Benham & Windham, Wavy scaly cloakfern, uncommon perennial, DAR, DCA, 3050–3560 ft; *WFM s.n.* (BGWMA); *JLB 939, SJ 6510* (SAT); *JF 535, 1125, 1156* (SRSC); *DSC & BHW 14982* (TEX-LL).

+ *Astrolepis windhamii* Benham, Windham cloakfern, uncommon perennial, DSC, SYG, 2200–4700 ft; *JF 1697, 1705, 1892, 2202* (SRSC).

Cheilanthes alabamensis (Buckl.) Kunze, Alabama lipfern, rare perennial, DCA, SYG, 4650 ft; *JF 2199, MT 229* (SRSC); *MT 229* (TEX-LL).

§ *Cheilanthes bonariensis* (Willd.) Proctor, Golden lipfern, perennial, 4650 ft; *BA2 5394* (SAT).

Cheilanthes eatonii Baker, Eaton lipfern, occasional perennial, DSC, SYG, 3700–4960 ft; *JF 767, 1201, 1501, MT 116, BHW 20629* (SRSC).

Cheilanthes feei T. Moore, Slender lipfern, occasional perennial, DCA, SYG, 3050–4900 ft; *JF 533, 758, 1127, 1200, 1500, 1708, 1919, BHW 10765, 20605* (SRSC); *BHW 10765* (TEX-LL).

Cheilanthes horridula Maxon, Rough lipfern, occasional perennial, DAR, DCA, RIO, 1850–3050 ft; *CMR 2602* (BGWMA); *BA2 5498, 5580, HC 36, 40* (SAT); *JF 670, 1059, 1141, 1611, 2046, TR 465, BHW 18412, 20607* (SRSC); *DSC & BHW 14977* (TEX-LL).

Cheilanthes villosa Davenp. ex Maxon, Villous lipfern, uncommon perennial, DCA, 3560–3800 ft; *JLB 2596, 3801* (SAT); *JF 533a, BHW 10757* (SRSC); *BHW 10757, DSC & BHW 14983* (TEX-LL).

§ *Notholaena aschenborniana* Klotzsch, Scaled cloakfern, rare perennial; *JLB 2597, 2956* (SAT).

§ *Notholaena greggii* (Mett. ex Kuhn) Maxon, Gregg cloak fern, uncommon perennial, DCA, 1800–4300 ft; *CMR 2600* (BGWMA); *JLB 2600* (SAT); *BHW 10841, BHW 20897, BHW & LCH 16061, BHW & MCJ 16859* (SRSC); *DSC & BHW 14978, DS 1096* (TEX-LL).

Notholaena nealleyi Seaton ex J.M. Coult., Nealley cloak fern, rare perennial, DSC, DCA, 3650 ft; *JLB 3806* (SAT); *JF 479* (SRSC).

Notholaena neglecta Maxon, Maxon cloak fern, rare perennial, DCA, 1850–3560 ft; *JF 603, 1088* (SRSC); *DSC 14984, DSC & BHW 14979* (TEX-LL).

Notholaena standleyi Maxon, Star cloak fern, occasional perennial, DSC, DAR, DCA, SYG, 2880–4360 ft; *JLB 2595, KJC 176, HC 35, ECM 251* (SAT); *JF 604, 867, 1126, 1007a, BHW 9157, BHW & LCH 15987* (SRSC); *DSC & BHW 14985, BHW 9157* (TEX-LL).

Pellaea atropurpurea (L.) Link, Purple cliffbrake, rare perennial, SYG, CHP, 3500–5680 ft; *JF 1285, 1299a, 2200, BHW & LCH BG-144* (SRSC).

Pellaea intermedia Mett. ex Kuhn, Intermediate cliffbrake, rare perennial, SYG, CHP, 2560–4900 ft; *JF 1199, 2201, MT 119* (SRSC). *BHW 559* (TEX-LL).

CONIFEROPHYTA

Cupressaceae

Juniperus coahuilensis (Martínez) Gaussen [*Juniperus erythrocarpa* Cory], Rose-fruited juniper, rare shrub-tree, CHP, 4600–5470 ft; *JF 1240* (BIBE); *JF 1037, 1219, 1240, MT 237* (SRSC); *BA2 5370* (SAT).

Juniperus pinchotii Sudw., Red-berry Juniper, uncommon shrub-tree, DCA, SYG, CHP; 3050–5680 ft; *PVW s.n.* (KANU); *JF 499, 1048, 1136, 1298, 1913, AMP & SAP 5135, BHW & LCH BG-157* (SRSC).

Pinaceae

§ *Pinus cembroides* Zucc., Mexican pinyon, rare tree, SYG, ca. 4200–5300 ft; *WFM 54* (BGWMA); *BA2 5229* (SAT); *BHW 313* (SRSC).

Pinus remota (Little) D.K. Bailey & Hawksw., Papershell pinyon, rare tree, SYG, 5200 ft; *JF 1249, 1310, MT 88, 258, AMP 5492* (SRSC).

GNETOPHYTA

Ephedraceae

§ *Ephedra antisyphilitica* Berland. ex C.A. Mey., Clapweed, uncommon to "frequent" shrub, DSC, 3520 ft; *CMR 17227* (BIBE); *BHW 490* (SRSC & TEX-LL).

Ephedra aspera Engelm. ex S. Watson [*Ephedra nevadensis* var. *aspera* (Engelm. ex S. Watson) L.D. Benson], Rough jointfir, common shrub, DSC, DAR, DCA, SYG, CHP, 1900–5250 ft; *OES 1366* (BIBE); *BA2 5710, ECM 72, CMR 17227* (SAT); *JF 349, 455, 474, 563, 578, 723, 745a, 806, 1003, 1237, 1438, 1485, 1665, 2052, JF & MD 583, OES 1365, 1743, BHW 1742* (SRSC).

Ephedra trifurca Torr. ex S. Watson, Longleaf jointfir, common shrub, DSC, DCA, 1800–3500 ft; *EGM 143, ACK 830* (BIBE); *HCC 1856* (NYBG); *CMR 14224, 17226* (SAT); *JF 1388, BHW 47059* (SRSC); *BHW & RRI 557a, 57b, 47059* (TEX-LL).

ANTHOPHYTA, Monocotyledones

Agavaceae

#Δ *Agave havardiana* Trel., Havard century plant, rare shrub/semi-succulent, SYG, 5840 ft; South end of southern Sue Peak.

Agave lechuguilla Torr., Lechuguilla, abundant shrub/semi-succulent, DSC, DCA, SYG, 1800–5840 ft; *BA2 5264, DB s.n.* (SAT); *JF 257, TR 78* (SRSC); *MSY s.n.* (TEX-LL).

Amaryllidaceae

Cooperia drummondii Herbert, Evening rainlily, uncommon perennial herb, DSC, SYG, CHP 3150–5840 ft; *BA2 5686* (SAT); *JF 1102, 1984* (SRSC).

Zephyranthes longifolia Hemsl., Copper zephyrlily, rare perennial herb, DSC, SYG, 3500–4840 ft; *JF 584, BHW 1080-178* (SRSC).

Bromeliaceae

Hechtia texensis S. Watson [*Hechtia scariosa* L.B. Sm], Texas false agave, occasional shrub/semi-succulent, rock, DSC, 1800–4300 ft; *DG 219* (BIBE); *BA2 5253, 5273, DG 219, MC s.n.* (SAT); *JF 328, 1002, 1004, OES 1323, BHW 13036, 14047, 20625, 21206* (SRSC); *AT 2242* (TEX-LL).

Commelinaceae

Commelina erecta L., Whitemouth dayflower, rare perennial herb, DAR, DSC, 2300–2400 ft; *BRM 3032* (BGWMA); *JF 1445, OCW 507* (SRSC).

§ *Tradescantia wrightii* Rose & Bush var. *glandulopubescens* B.L. Turner, Wright spiderwort, rare perennial herb, 3800 ft; *BHW 10775* (SRSC & TEX-LL).

Cyperaceae

Carex muriculata F.J. Herm. [*Carex schiedeana* Kunze], Schiede sedge, uncommon perennial, SYG, 3000–5250 ft; *BHW & LCH BG-136* (BGWMA); *JF 2193* (BIBE); *BA2 5219, 5305* (SAT); *JF 772, 1193, 1236, 2193, MT 69, BHW 10821, 10847, BHW & LCH BG-136* (SRSC); *JF 1236, BHW 10821* (TEX-LL).

§ *Cladium mariscus* (L.) Pohl ssp. *jamaicense* (Crantz) Kükenth, Jamaica swamp sawgrass, uncommon perennial, ca. 1800 ft; *BHW 13068* (SRSC).

+o *Cyperus elegans* L., Royal flatsedge, rare perennial, DAR, 2400 ft; *JF 1449* (SRSC).

§ *Cyperus laevigatus* L., Smooth flatsedge, "rare" perennial, DCA, 1800 ft; *BHW 772* (SRSC).

§ *Cyperus odoratus* L., Fragrant flatsedge, "infrequent" annual or perennial, RIO, 1800 ft; *CAB 31* (BIBE); *JS s.n., EGM 162m, BHW 13046, 21441* (SRSC); *BHW 327* (TEX-LL).

§ *Cyperus squarrosus* L., Bearded flatsedge, "rare to infrequent" annual, RIO, 1800 ft; *BHW 774* (SRSC & TEX-LL).

§ *Eleocharis geniculata* (L.) Roemer & J.A. Schultes [*Eleocharis caribaea* (Rottb.) S.F. Blake], Canada spikesedge, "infrequent" annual, RIO, 1800 ft; *BHW 13047* (BIBE & SRSC); *BHW 772b* (TEX-LL). Last collected in 1955.

§ *Eleocharis montevidensis* Kunth, Sand spikerush, "frequent" annual, RIO, 1800 ft; *HTF 288* (SRSC).

§ *Eleocharis palustris* (L.) Roemer & J.A. Schultes [*Eleocharis macrostachya* Britton], Common spikerush, "frequent" perennial, ca. 3000 ft; *BHW & MCJ 16673* (SRSC).

§ *Fuirena simplex* Vahl var. *aristulata* (Torr.) Kral, Western umbrella-sedge, uncommon perennial, RIO, 1800 ft; *BA2 4605* (SAT); *BHW 21444* (SRSC & TEX-LL).

§ *Schoenoplectus pungens* (Vahl) Palla [*Scirpus americanus* Pers. var. *longispicatus* Britton], Common threesquare, perennial, *OES 1350* (SRSC).

Juncaceae

§ *Juncus acuminatus* Michx., Tapertip rush, perennial, 1800 ft; *CMR 17236* (SAT).

§ *Juncus bufonius* L., Toad rush, rare annual, RIO, 1800 ft; *BHW C298* (SRSC & TEX-LL).

Liliaceae

Allium kunthii G. Don, Kunth onion, rare perennial herb, SYG, 4700–5500 ft; *JF 1514, 1983* (SRSC).

Dasylirion leiophyllum Engelm. ex Trel., Sotol, common shrub/semi-succulent, DSC, DAR, DCA, SYG, CHP, ca. 3000–5840 ft *WFM s.n., TR s.n.* (BGWMA); *OES 1321* (BIBE); *JF 860, OES s.n.* (SRSC).

Nolina erumpens (Torr.) S. Watson, Foothill beargrass, shrub/semi-succulent, SYG, CHP, 4320 ft; *BA2 5704* (SAT); *JF 128, 821, AMP & SAP 5127, TR 130, MT 188, 190* (SRSC); *BHW & LCH BG-167* (SRSC & TEX-LL).

§ *Nolina texana* S. Watson, Texas sacahuista, rare shrub/semi-succulent; 3500 ft; *BHW & LCH s.n.* (BGWMA).

Nothoscordum bivalve (L.) Britt., Crowpoison, rare perennial herb; SYG; *BHW 10773* (SRSC). Collected in 1952 at the head of Heath Canyon.

§ *Yucca elata* Engelm., Soaptree yucca, shrub/semi-succulent, DSC, DCA, 3520 ft; *BA2 & DG 4861, BHW 877* (BIBE); *BA2 4861* (SAT); *BHW 877* (SRSC); *BHW 877, s.n., MSY s.n.* (TEX-LL).

§ *Yucca faxoniana* Sarg., Giant dagger yucca, occasional shrub/semi-succulent, DSC, SYG, CHP, 3500–5840 ft *OES 1322* (BIBE); *BRM s.n.* (BGWMA); *SMU 162* (SAT); *WH, TA, LS, & JP 9024, OWS 1322, MT 124* (SRSC); *RN E-4-6-92, 5-8-92, BHW Lot 45* (SRSC & TEX-LL).

Yucca rostrata Engelm. ex Trel., Beaked yucca, occasional shrub/semi-succulent, DSC, 2150–3400 ft; *PVW s.n.* (KANU); *WH, TA, LS & JP 9025, JF 849, TR 129, MT 50, BHW & LCH BG-62* (SRSC); *RN E-5-08-92, 4-6-1992* (TEX-LL).

§ *Yucca thompsoniana* Trel., Thompson yucca, occasional shrub/semi-succulent; *MSY s.n.* (TEX-LL).

Yucca torreyi Shafer, Torrey yucca, occasional shrub/semi-succulent, DSC, DAR, DCA, SYG, 2100–3500 ft; *SMU 164* (SAT); *WH, TA, LS & JP 9026, JF 683, 1723* (SRSC); *BHW 9940* (TEX-LL).

Orchidaceae

Dichromanthus cinnabarinus (Llave & Lex.) Garay, Scarlet ladies' tresses, rare perennial herb, SYG, 5500 ft; *JF 1958* (SRSC).

Poaceae

◆# *Achnatherum curvifolium* (Swallen) Barkworth [*Stipa curvifolia* Swallen], Guadalupe ricegrass, rare perennial herb, SYG, 5000 ft; *JF 735a* (SRSC).

Achnatherum eminens (Cav.) Barkworth [*Stipa eminens* Cav.], Southwestern needlegrass, rare perennial herb, DSC, SYG, 3400–5300 ft; *JF 366, 1990; BHW 10768* (SRSC); *BHW 10768* (TEX-LL).

Achnatherum lobatum (Swallen) Barkworth [*Stipa lobata* Swallen], Littleawn needlegrass, uncommon perennial herb, DSC, SYG, 3800–5000 ft; *JF 760, MT 146, BHW 10771* (SRSC); *BHW 10771* (TEX-LL).

§ *Andropogon glomeratus* (Walt.) B.S.P., Bushy bluestem, perennial herb, RIO, 1800 ft; *CAB 30* (BIBE).

+○ *Aristida adscensionis* L., Six-weeks threeawn, rare annual herb, SYG, 5300–5840 ft; *JF 1304, 1918, 1987* (SRSC).

Aristida purpurea Nutt. var. *purpurea* [*Aristida roemeriana* Scheele], Purple threeawn, occasional perennial herb, DSC, DAR, DCA, 1800–3400 ft; *JF 173, 325, 344, 1327, 1382, 2079; MT 71* (SRSC).

Aristida purpurea Nutt. var. *nealleyi* (Vasey) Allred [*Aristida glauca* (Nees) Walp.], Blue threeawn, common perennial herb, DSC, DAR, DCA, SYG, 2250–4800 ft; *JF 486, 811, 935, 1178, 1192, 1536, 1537, CMR 5069, MT 70, 160, BHW 10758, 10811, 10816, 10835, BHW & LCH BG-159, 191, 193* (SRSC); *GJG & UTW 4628, BHW 10758, 10811, 10816, 10835, 13028* (TEX-LL).

§ *Aristida purpurea* Nutt. var. *wrightii* (Nash) Allred, Wright threeawn, perennial herb; 3500 ft; *BHW & LCH BG-159.*

§ *Aristida ternipes* Cav., Spidergrass, "frequent" perennial herb; 1800 ft; *BHW 20944, 20946; BHW & LCH BG-186* (SRSC).

!!+ *Arundo donax* L., Giant reed, abundant perennial herb, RIO, DCA, 1800 ft; *JF 2039* (SRSC).

+○ *Blepharidachne bigelovii* (S. Wats.) Hack., Bigelow desertgrass, rare perennial herb, DSC, 3440 ft; *JF 355* (SRSC).

Bothriochloa barbinodis (Lag.) Herter, Cane bluestem, uncommon perennial herb, DAR, SYG, RIO, 1800–4400 ft; *BHW 779* (BIBE); *JF 1534* (SRSC).

Bothriochloa laguroides (DC.) Herter ssp. *torreyana* (Steud.) Allred & Gould, Silver Beardgrass, occasional perennial herb, DAR, DCA, 2350–4360 ft; *CMR 5096* (BGWMA); *JF 358, 531, 937, 1113, 1371, 1377, 1531, MT 198, 224, BHW s.n., BHW & BLT 8320* (SRSC); *BHW 21514, BHW & BLT 8320* (TEX-LL).

§ *Bouteloua aristidoides* (Kunth) Griseb., Needle grama, "frequent" annual herb, DSC, RIO, 1800 ft; *BA2, DG, TE, & PC 4597a, BHW 13034* (BIBE); *BHW 12894, 13034* (SRSC).

Bouteloua barbata Lag., Sixweeks grama, rare annual herb, RIO, DCA, 1800 ft; *BA2, DG, TE, & PC 4597b* (BIBE); *JF 2096* (SRSC).

Bouteloua curtipendula (Michx.) Torr. var. *caespitosa* Gould & Kapadia, Sideoats grama, common perennial herb, DSC, DAR, DCA, SYG, CHP, 1800–5250 ft; *JF 254, 1107, 1176, 1238, 1393, 1512, 1524, 2139, 2166, MT 38, 162, BHW 10780, BHW & LCH BG-190, BHW & BLT 8329* (SRSC); *BHW 10780* (TEX-LL).

+ *Bouteloua eriopoda* (Torr.) Torr., Black grama, rare perennial herb, SYG, 4400 ft; *JF 1533* (SRSC). Upper TC trail area.

+ *Bouteloua hirsuta* Lag., Hairy grama, occasional perennial herb, SYG, CHP, 3300–5500 ft; *JF 1221* (BIBE); *JF 1027, 1032, 1221, 1248, 1256, 1319, 1523, MT 46, 80, 131, 175* (SRSC).

Bouteloua kayi Warnock, Kay grama, uncommon (G1S1) perennial herb, DSC, SYG, CHP, 3500–5800 ft; *JF 2186* (BIBE, SRSC, & TEX-LL); *JF 296, 1169, MT 134, 182, 191, OCW 318, BHW 20621* (SRSC).

Bouteloua ramosa Scribn. ex Vasey, Chino grama, abundant perennial herb, DSC, DAR, DCA, SYG, CHP, 1800–4400 ft; *CMR 5075* (BGWMA); *JF 191, 338, 443, 930, 1160a, 1331, 1452, 1544, 1545, 2009, 2152, BHW 10853* (SRSC).

Bouteloua trifida Thurb., Red grama, occasional to "frequent" perennial herb, DSC, DAR, DCA, 1800–3360 ft; *JF 341, 1398, 1406, 1474, 1476, 1543, 2144, BHW 12341, 21190, BHW & LCH BG-183* (SRSC); *TRV, GLB & WEH 85-38* (TEX-LL).

Cathestecum erectum Vasey & Hack., False grama, occasional perennial herb, DSC, 1800–2450 ft; *JF 1340, MT 121, 141, BHW 10813, 12900, BHW & MCJ 16842* (SRSC); *BHW 110813, 12900* (TEX-LL).

§ *Cenchrus spinifex* Cav. [*Cenchrus incertus* M.A. Curtis], Coastal sandbur, locally frequent annual or perennial herb, RIO, DCA, 1800–2400 ft; *BA2, DG, TE, & PC 4601* (BIBE); *AMP & SAP 5862, BHW 23037, BHW & MCJ 16844, BHW & BLT 8322* (SRSC); *BHW 16844* (TEX-LL).

Chloris virgata Sw., Feather fingergrass, rare annual herb, DSC, RIO, 1800–3440 ft; *JF 364* (SRSC); *EGM 51-1129* (TEX-LL).

! *Cynodon dactylon* (L.) Pers., Bermudagrass, locally abundant perennial herb, DCA, RIO, 1800–2350 ft; *BA2, DG, TE, & PC 4610* (BIBE); *JF 1336* (SRSC); *EGM 141, 51-1115* (TEX-LL).

Dasyochloa pulchella (Kunth) Willd. ex Rydb. [*Erioneuron pulchellum* (Kunth) Tateoka; *Tridens pulchellus* (Kunth) Hitchc.], fluffgrass, occasional perennial herb, DSC, DCA, 1900–2760 ft; *BA2, DG, TE, & PC 4595* (BIBE); *JF 194, 678, 1338, 2025, 2049, BHW & LCH BG-198* (SRSC).

Digitaria californica (Benth.) Henr., Arizona cottontop, uncommon perennial herb, DSC, DAR, DCA, SYG, CHP, 3000–4000 ft; *CMR 5095* (BGWMA); *JF 335, 839, BHW 10801* (SRSC); *BHW 10801* (TEX-LL).

§ *Digitaria ciliaris* (Retz.) Koel., Southern crabgrass, rare annual herb, 1800 ft; *BHW 775* (BIBE, SRSC, TEX-LL).

+○ *Digitaria pubiflora* (Vasey) J. Wipff [*Digitaria cognata*

(J.A. Schultes) Pilger var. *pubiflora* Vasey ex L.H. Dewey], Carolina crabgrass, rare perennial herb, DCA, 1800 ft; *JF 2121* (SRSC).

* *Echinochloa colona* (L.) Link, Junglerice, uncommon annual herb, DAR, RIO, 1800–3440 ft; *DG & TE 4611* (BIBE); *JF 1330, EGM 139, BHW 793* (SRSC); *EGM 51-1113, BHW 793* (TEX-LL).

§ *Echinochloa muricata* (Beauv.) Fern., Rough barnyardgrass, "rare" annual herb, RIO, 1800 ft; *BHW s.n.* (SRSC), *BHW C299* (TEX-LL).

Enneapogon desvauxii Desv. ex Beauv., Nineawn pappusgrass, occasional perennial herb, DAR, DCA, SYG, 1800–5000 ft; *JF 193, 231a, 347, 1510, 1551, 2097, BHW 10770, 12897, BHW & MCJ 16865* (SRSC); *BHW 10770* (TEX-LL).

Eragrostis intermedia A.S. Hitchc., Plains lovegrass, rare perennial herb, DSC, DCA, 2500–3800 ft; *JF 1894, BHW & MCJ 15984* (SRSC).

! *Eragrostis lehmanniana* Nees, Lehmann lovegrass, uncommon perennial herb, DAR, 2900–3440 ft; *CMR 16950* (BGWMA); *JF 211, 313, 1106, MT 202, BLT 22-143* (SRSC).

§ *Eragrostis pectinacea* (Michx.) Nees ex Steud., Tufted lovegrass, "infrequent" annual herb, RIO, 1800 ft; *BHW 785* (BIBE); *BHW C595* (TEX-LL).

Erioneuron avenaceum (Kunth) Tateoka, Shortleaf woolygrass, uncommon perennial herb, DSC, SYG, 3560–4400 ft; *JF 515, 1532* (SRSC); *BHW 10781* (TEX-LL).

Erioneuron pilosum (Buckl.) Nash, Hairy woolygrass, common perennial herb, DSC, DAR, DCA, SYG, CHP, 2150–5800 ft; *CMR 5089* (BGWMA); *JF 756, 850, 1031, 1057, 1179, 1225, 1251, 1271, 1992, 2160, JF & HL 1905, MT 44, 73, 174, 197, BHW 10781, BHW & LCH BG-75* (SRSC); *BHW 10789* (TEX-LL).

Hesperostipa neomexicana (Thurb. ex Coult.) Barkworth [*Stipa neomexicana* (Thurb. ex Coult.) Scribn], New mexico feathergrass, rare perennial herb, SYG, 5000 ft; *JF 735* (SRSC).

Heteropogon contortus (L.) Beauv. ex Roemer & J.A. Schultes, Tanglehead, occasional perennial herb, DAR, DCA, DSC, 1800–4400 ft; *JF 345, 574, 1396, 1473, 1596, 2138, MT 176, BHW 13074, 20947, BHW & LCH BG-189* (SRSC).

**Leptochloa dubia* (Kunth) Nees, Green sprangletop, uncommon perennial herb, DAR, SYG, 3750–5800 ft; *OCW 319* (BGWMA); *JF 233, 299, 1046, 1055, 1268, 1516, 1528, MT 231, OCW 319* (SRSC).

§ *Leptochloa fusca* (L.) Kunth ssp. *uninervia* (J. Presl) N. Snow [*Leptochloa uninervia* (J. Presl) A.S. Hitchc. & Chase], Mexican sprangletop, "infrequent to frequent" annual or perennial herb; RIO, 1800 ft; *HTF 289, BHW 13041* (SRSC); *EGM 140, 51-1114* (TEX-LL).

Leptochloa panicea (Retz.) Ohwi ssp. *mucronata* (Michx.) Nowack [*Leptochloa mucronata* (Michx.) Kunth], Mucronate sprangletop, rare annual or perennial herb, DSC, 2400 ft; *JF 1428* (SRSC).

Lycurus phleoides Kunth, Wolfstail, uncommon perennial herb, SYG, CHP, 3800–5000 ft; *JF 1034, MT 39, BHW 10769* (SRSC); *BHW 10769* (TEX-LL).

+o *Lycurus setosus* (Nutt.) C.G. Reeder, Bristly wolfstail, rare perennial herb, SYG, CHP, 5150 ft; *JF 1230* (SRSC). DH plateau.

\+ *Melica montezumae* Piper, Montezuma melicgrass, rare perennial herb, DSC/DCA, 4040 ft; *JF 721* (SRSC).

Muhlenbergia arenicola Buckl., Sand muhly, rare perennial herb, SYG, 5300 ft; *JF 1253* (BIBE); *JF 1253, 1991* (SRSC).

Muhlenbergia dubia Fourn. ex Hemsl., Pine muhly, occasional perennial herb, DAR, SYG, 3500–5500 ft; *JF 734, 762, 1217, 1261, 2180* (SRSC). Possibly the dominant grass above 5000 ft.

Muhlenbergia porteri Scribn. ex Beal, Bush muhly, uncommon perennial herb, DSC, DAR, 2900 ft; *CMR 16956* (BGWMA); *JF 207* (SRSC).

\+ *Muhlenbergia rigens* (Benth.) A.S. Hitchc., Deergrass, rare perennial herb, DAR/SYG, 4320 ft; *JF 1527* (SRSC).

§ *Muhlenbergia setifolia* Vasey, Curlyleaf muhly, perennial herb, DCA; *OCW 316* (BGWMA & SRSC).

Muhlenbergia spiciformis Trin. [*Muhlenbergia parviglumis* Vasey], Longawn muhly, occasional perennial herb, SYG, CHP, 4280–5840 ft; *JF 1053, 1216, 1243, 1262, 1303, 1513, 1525* (SRSC).

Muhlenbergia tenuifolia (Kunth) Trin., [*Muhlenbergia monticola* Buckl, Slender muhly, locally common annual or perennial herb, DCA, SYG, CHP, 5000 ft; *OCW 315b* (BGWMA & SRSC); *JF 845, 1191, 1489a, 1515, 1526, 1930, BHW 10750* (SRSC).

Panicum hallii Vasey, Hall panicgrass, common perennial herb, DSC, DAR, DCA, SYG, CHP, 2400–5150 ft; *CMR 5091* (BGWMA); *BHW 12893* (BIBE); *JF 195, 575, 1221a, 1229, 1395, 1456, 1519, 1921, MT 81, 211, BHW & LCH BG-192* (SRSC).

§ *Panicum hirticaule* J. Presl, Mexican panicgrass, uncommon annual herb, DSC, 1800–3800 ft; *BHW 12896* (BIBE); *BHW 10795* (SRSC & TEX-LL).

Panicum obtusum Kunth , Vine mesquite, rare perennial herb, SYG, 5300 ft; *JF 1997, TR s.n.* (SRSC).

Pappophorum bicolor Fourn., Pink pappusgrass, rare to "infrequent" perennial herb, DAR, DCA, 3050–3700 ft; *JF 1105* (BIBE & SRSC); *BHW 20629, BHW & LCH BG-166* (SRSC).

Pappophorum vaginatum Buckl., Whiplash pappusgrass, uncommon perennial herb, DSC, DAR, 2350–3480 ft; *JF 1394a* (BIBE & SRSC); *JF 1095, 1368, 1412, BHW & LCH BG-151* (SRSC).

* *Pennisetum ciliare* (L.) Link, [*Cenchrus ciliaris* L.], Buffelgrass, overall rare, but locally abundant perennial herb, DSC, DAR, DCA, RIO, 1850–2500 ft; *BA2 4323* (BIBE); *JF 1065, 2222; AMP 5861* (SRSC).

§ *Phragmites australis* (Cav.) Trin. ex Steud., Common reed, locally abundant perennial herb, RIO, 1800 ft; *WFM s.n.* (BIBE).

Pleuraphis mutica Buckl. [*Hilaria mutica* (Buckl.) Benth.], Tobosa grass, uncommon perennial herb, DSC, DAR, SYG, 2350–5300 ft; *DG & TE 4614* (BIBE); *JF 1255, 1399, 1435, 1478* (SRSC).

Poa bigelovii Vasey & Scribn., Bigelow bluegrass, uncommon annual herb, DSC, DCA, 3560 ft; *JF 516, 537, BHW 21134, 47056, BHW & MCJ 15982, 15984* (SRSC); *BHW 21134* (TEX-LL).

*§ *Polypogon monspeliensis* (L.) Desf. [*Alopecurus monspeliensis* L.], Rabbitfoot grass, locally occasional annual herb, RIO, 1800 ft; *HTF 290* (SRSC).

Schizachyrium scoparium (Michx.) Nash, Little bluestem, rare perennial herb, DCA, 3500–4650 ft; *JF 1950* (BIBE); *JF 1939, 1950, OCW 317* (SRSC).

+ *Setaria grisebachii* Fourn., Grisebach bristlegrass, rare annual herb, DSC, 2960 ft; *JF 217* (SRSC).

Setaria leucopila (Scribn. & Merr.) K. Schum., Streambed bristlegrass, occasional perennial herb, DSC, DAR, DCA, SYG, 2400–5300 ft; *JF 356, 1134, 1416, 1988, MT 102* (SRSC); *EGM 164* (TEX-LL).

§ *Setaria parviflora* (Poir.) Kerguélen [*Setaria geniculata* P. Beauv], Marsh bristlegrass, locally common perennial herb, RIO, 1800 ft; *CAB 32, BHW 13053* (BIBE); *BHW 13053* (SRSC); *EGM 51-1112, BHW 13053* (TEX-LL).

§ *Setaria reverchonii* (Vasey) Pilger, [*Setaria ramiseta* (Scribn.) Pilg.], Reverchon bristlegrass, perennial herb; 1800 ft; *BHW & MCJ 16856* (SRSC).

!+ *Sorghum halepense* (L.) Pers., Johnsongrass, rare perennial herb, DAR, 3440 ft; *JF 362* (SRSC).

Sporobolus airoides (Torr.) Torr., Alkali sacaton, uncommon perennial herb, DSC, SYG, 1800–5300 ft; *JF 1254, 1542, BGH 642* (SRSC).

Sporobolus cryptandrus (Torr.) Gray, Sand dropseed, uncommon perennial herb, DSC, DAR, DCA, SYG, 1800–5300 ft; *JF 352, 1999, 2050, 2146, MT 103* (SRSC).

§ *Sporobolus flexuosus* (Thurb. ex Vasey) Rydb., Mesa dropseed, "frequent" perennial herb, RIO, 1800 ft; *BHW & MCJ 16845, 16853* (SRSC).

§ *Sporobolus pyramidatus* (Lam.) A.S. Hitchc., Madagascar dropseed, "infrequent" annual or perennial herb, RIO, 1800 ft; *BHW 786* (SRSC).

§ *Sporobolus wrightii* Munro ex Scribn., Big sacaton, perennial herb; *EGM 123* (SRSC); *EGM 123, 51-1110* (TEX-LL).

§ *Tridens eragrostoides* (Vasey & Scribn.) Nash, Lovegrass tridens, perennial herb, 3700 ft; *BHW 20626* (SRSC).

Tridens muticus (Torr.) Nash, Slim tridens, common perennial herb, DSC, DAR, DCA, SYG, 1800–5500 ft; *JF 327* (BIBE); *JF 196, 208, 212, 327, 762a, 1017, 1039, 1174, 1177, 1260, 1369, 1437, 1475, 1937, 2017, 2078, TR 25, MT 138, 161, BHW 10789, 20628, BHW & LCH BG-65, BG-179* (SRSC).

Urochloa arizonica (Scribn. & Merr.) O. Morrone & F. Zuloaga [*Panicum arizonicum* Scribn. & Merr.], Arizona signalgrass, uncommon annual herb, RIO, DCA, 1800 ft; *JF 2105, BHW 12896, 20945, BHW & MCJ 16855* (SRSC).

§ *Vulpia octoflora* (Walt.) Rydb., Sixweeks fescue, annual herb, DCA; *RRI 21160* (TEX-LL).

Typhaceae

§ *Typha domingensis* Pers., Southern cattail, perennial herb, RIO, 1800 ft; *EGM 155* (SRSC); *BHW 835* (BIBE & TEX-LL).

ANTHOPHYTA, Eudicotyledones

Acanthaceae

Carlowrightia arizonica A. Gray, Arizona carlowrightia, uncommon subshrub, slickrock crevices, rocky soil, DSC, DAR, DCA, 1800–2350 ft; *BHW 12898* (BIBE); *JF 648, 1342, 2061, BHW 8334, 12898, 18408* (SRSC).

+ *Carlowrightia serpyllifolia* A. Gray, Trans-Pecos wrightwort, occasional subshrub, DSC, DCA, 3680 ft; *JF 447, 607, 667, 972, 1013, 1343, 2016, 2080* (SRSC).

● *Dyschoriste linearis* var. *cinerascens* (Henrickson & Hilsenb.) B.L. Turner, Polkadots, uncommon and "locally frequent" perennial herb, DSC, DAR, DCA, 2150–4360 ft; *BRM 3138, CMR 5093* (BGWMA); *BA2 5198, 5350, JF 1517, 1915, MT 65, BLT 22-145, BLT & BD 23-177, BHW & LCH 160* (SRSC); *BLT 22-145, BHW& LCH BG-87, BG-160* (TEX-LL).

● *Justicia pilosella* (Nees) Hilsenb., Gregg tubetounge, uncommon perennial herb, DSC, DAR, DCA, 2100–3050 ft; *JF 1133, 1351, TRV s.n., BHW 21195* (SRSC).

Justicia warnockii B.L. Turner, Warnock water-willow, occasional subshrub, DSC, DAR, DCA, 1800–3720 ft; *BHW & LCH BG-137* (BGWMA); *AL 161, 162, CMR 17231, BHW 13063(266)* (BIBE); *JF 229, 687, 1667, 2053, 2087, MT 152, 181, 227, BLT 22-149, BLT & BD 23-178, BHW 10786, 13063, 20410, BHW & LCH BG-137, BHW & MCJ 16827* (SRSC); *BLT 22-149, BLT & BD 23-178, BHW 10786, BHW & LCH s.n.* (TEX-LL).

Ruellia parryi A. Gray, Parry wild petunia, common subshrub, DSC, DAR, DCA, 1800–4600 ft; *SMU 48* (BGWMA); *JF 202, 434, 520, 829, 945, 2042, 2113, AMP & SAP 5136, MT 27, BLT 22-144* (SRSC); *BLT 22-144* (TEX-LL).

Amaranthaceae

*+ *Amaranthus blitoides* S. Wats., Mat amaranth, rare annual herb, DAR, 3000 ft; *JF 218* (SRSC).

§ *Amaranthus palmeri* S. Wats., Carelessweed, annual herb, RIO, 1800 ft; *EGM 125, 128, 136* (BIBE).

Amaranthus scleropoides Uline & Bray, Bonebract amaranth, rare annual herb, DCA, 1800 ft; *JF 2107* (SRSC).

§ *Amaranthus torreyi* (Gray) Benth. ex S. Wats., Torrey amaranthus, "frequent" annual herb, DSC, 3800 ft; *BHW 10796* (SRSC & TEX-LL).

§ *Froelichia arizonica* Thornb. ex Standl., Arizona snakecotton, "occasional" perennial herb, DSC, DAR, DCA; *BHW & BLT 8318, BHW & MCJ 16847, GLW 4477* (SRSC); *DSC & HBC 30635, BLT & MT2 97-333* (TEX-LL).

Tidestromia lanuginosa (Nutt.) Standl., Wooly tidestromia, uncommon annual herb, DSC, DCA, 2850 ft; *JF 942, BHW & MCJ 16852* (SRSC).

Tidestromia suffruticosa (Torr.) Standl., Shrubby honeysweet, occasional subshrub, DSC, DCA, 1800–2760 ft; *JF 149, 197, BHW 694* (SRSC); *BHW 694* (TEX-LL).

Anacardiaceae

Rhus microphylla Engelm. ex A. Gray, Littleleaf sumac, rare shrub, DAR, 2100–2400 ft; *CMR 5076* (BGWMA); *JF 1444, BHW & LCH BG-89* (SRSC).

Rhus trilobata var. *pilosissima* Engl., Skunkbush sumac, rare shrub, CHP, 5680 ft; *JF 1292* (SRSC).

Rhus virens Lindh. ex A. Gray var. *virens*, Evergreen sumac, uncommon to occasional shrub, DCA, CHP, 3050–5680 ft; *CMR 15830* (BGWMA); *JF 767a, 1040, 1135, 1182, 1295, 1508* (SRSC).

Apocynaceae

Haplophyton crooksii (L.D. Benson) L.D. Benson [*Haplophyton cimicidum* A. DC. var. *crooksii* L. Benson], Cockroach plant, rare perennial herb, DCA, 1850 ft; *JF 1067* (SRSC).

Telosiphonia macrosiphon (Torr.) Henrickson, [*Macrosiphonia macrosiphon* (Torr.) A. Heller], Rocktrumpet, uncommon subshrub, DSC, DAR, 2700–3350 ft; *CMR 11625* (BGWMA); *JF 815, 933, 1481* (SRSC).

Aristolochiaceae

Aristolochia coryi I.M. Johnst., Dutchman pipe, occasional perennial herb, DSC, DAR, DCA, RIO, SYG, 1800–4280 ft; *BA2, DG, TE, & B 4933* (BIBE); *BA2 5716* (SAT); *JF 955, 1483, 1491, 2093, 2119, BLT & MT2 97-338, BHW 8332* (SRSC); *BLT & MT2 97-338* (TEX-LL).

Asclepiadaceae

\+ *Asclepias asperula* (Dcne.) Woods., Spider milkweed, uncommon perennial herb, DSC, 2560–3800 ft; *JF 368, 1405, 1911* (SRSC).

Asclepias oenotheroides Cham. & Schlecht., Zizotes milkweed, rare perennial herb, DSC, DCA, 2300–2750 ft; *JF 914* (SRSC); *BLT & MT2 97-341* (TEX-LL).

\# *Asclepias sperryi* Woods., Sperry milkweed, rare subshrub, CHP, 5100–5680 ft; *JF 1286, 2194* (SRSC).

§ *Cynanchum barbigerum* (Scheele) Shinners, Bearded swallow-wort, perennial herbaceous vine; *JLB 870* (SAT).

Cynanchum pringlei (Gray) Henrickson, [*Cynanchum barbigerum* var. *breviflorum* Shinners], Pringle swallow-wort, uncommon to occasional perennial herbaceous vine, DSC, DAR, DCA, 3000–4240 ft; *BA2 5315* (SAT); *JF 256, 301, 1164, 1488, 2203, MT 30, BLT & BD 23-174, BHW 10785, BHW & LCH BG-133* (SRSC); *BLT & BD 23-173, BHW 10785, BHW & LCH BG-133* (TEX-LL).

Cynanchum racemosum (Jacq.) Jacq. var. *unifarium* (Scheele) E. Sundell, [*Cynanchum unifarium* (Scheele) Woodson], Talayote, uncommon to locally common perennial herbaceous vine, DAR, DCA, 2780–4040 ft; *JF 1928, AL 144* (BIBE); *BA2 5317* (SAT); *JF 169, 858, 1928* (SRSC).

\# *Matelea parvifolia* (Torr.) Woods., Spearleaf milkvine, rare perennial herbaceous vine, DSC/DAR, 1900 ft; *JF 2057* (SRSC).

§ *Matelea producta* (Torr.) Woods., Texas milkvine, perennial herbaceous vine, RIO, 1800 ft; *BHW 13050* (BIBE).

Matelea reticulata (Engelm. ex Gray) Woods., Netted milkvine, uncommon perennial herbaceous vine, DAR, DCA, 3160–4600 ft; *BRM 3225, BHW & LCH BG-170* (BGWMA); *JF 1938* (BIBE); *BA2 5339* (SAT); *JF 221, 1938, JF & MY 1317, AMP & SAP 5132, BHW & LCH BG-170* (SRSC).

\#◆ *Matelea sagittifolia* (Gray) Woods., Arrowleaf milkvine, rare perennial herbaceous vine, DSC, 3350 ft; *JF 1484* (SRSC).

§ *Sarcostemma crispum* Benth., Wavyleaf twinvine, perennial herbaceous vine, DSC; *TR 147* (BGWMA); *BA2 5365* (SAT).

§ *Sarcostemma cynanchoides* Dcne. var. *cynanchoides*, Fringed twinevine, "frequent on shrubs", perennial herbaceous vine, RIO, DSC, 1825 ft; *BA2 & DG 5158* (BIBE); *BHW 13050* (TEX-LL).

Sarcostemma cynanchoides Dcne. var. *hartwegii* (Vail) Shinners, Hartweg twinevine, rare perennial herbaceous vine, DSC, DCA, 1800–2350 ft; *JF 1347* (SRSC); *BHW 12904* (BIBE, SRSC, TEX-LL).

Sarcostemma torreyi (Gray) Woods., Soft twinevine, uncommon perennial herbaceous vine, DAR, DCA, RIO, 1800–4650 ft; *BA2 5223, 5280, 5375* (SAT); *JF 1956, 2000, TR 147, BHW 13050, BHW & LCH BG-165* (SRSC).

Asteraceae

Acourtia runcinata (Lag. ex D. Don) B.L. Turner, Featherleaf desertpeony, occasional perennial herb, DSC, DCA, 1800–3700 ft; *BRM 3147* (BGWMA); *BA2 5217, 5440* (SAT); *JF 147, 302, 459, 1339, 1353, 2115, OCW 342, BHW 10815, 20610, BHW & LCH BG-181, BHW & MCJ 15899* (SRSC); *BLT & MT 97-339, BHW 10815* (TEX-LL).

Ageratina wrightii (A. Gray) R.M. King & H. Rob., [*Eupatorium wrightii* A. Gray], Wright snakeroot, uncommon shrub, DSC, DCA, SYG, 4040–4900 ft; *OCW s.n.* (BGWMA); *JF 722, 1549, 2189; OCW 336* (SRSC); *BA2 5481, 5457* (TEX-LL).

§ *Ambrosia confertiflora* DC., Weakleaf burr ragweed, perennial herb; *BA2 5360* (SAT).

§ *Aphanostephus ramosissimus* DC. var. *humilis* (Benth.) B.L. Turner & Birdsong, Plains dozedaisy, annual herb, DCA, RIO, 1800–2560 ft; *AL 310* (BIBE); *VLC 18730* (TEX-LL).

Artemisia ludoviciana Nutt. var. *ludoviciana*, White sagebrush, occasional perennial herb, DSC, DAR, DCA, SYG, CHP, 3050–5680 ft; *BA2 5491* (SAT); *JF 222a, 1152* (SRSC); *BA2, DG & TE 5491* (TEX-LL).

\# *Baccharis havardii* Gray, Havard false willow, rare subshrub, DAR, DCA, 4050–4350 ft; *JF 1933, 1941* (SRSC).

Baccharis salicifolia (Ruiz & Pavón) Pers., [*Baccharis glutinosa* Pers.], Seepwillow, jara, locally common shrub, DAR, DCA, RIO, 1800–4280 ft; *EGM 12* (BIBE); *BA2 5511* (SAT); *JF 1345* (SRSC); *BA2, DG & ET 5511* (TEX-LL).

§● *Baccharis salicina* Torr. & Gray, Great plains false willow, subshrub, DSC; *BGH 643* (SRSC).

Bahia absinthifolia Benth. var. *dealbata* (Gray) Gray, Dealbata bahia, common perennial herb, DSC, DAR, 1800–3560 ft; *BHW 12888* (BIBE); *JF 347a, 543, 810, 2109, MT 120, 235, 253, BHW 12888, GLW 4486* (SRSC); *BA2 & TE 5301, BHW 12888* (TEX-LL).

Bahia pedata Gray, Bluntscale bahia, uncommon annual herb, DSC, DCA, 3050–3150 ft; *JF 1102a, 1104* (SRSC); *WFB 67* (TEX-LL).

Baileya multiradiata Harvey & Gray ex Gray, Desert marigold, common to occasional annual herb, DSC, DAR, DCA, 2400–3050 ft; *BA2, DG, TE, & PC 4598, CN 1194;* (BIBE); *JF 1132, 1455, 1466, MT 16* (SRSC).

Brickellia coulteri Gray, Coulter brickellia, occasional subshrub, wash gravel, crevices in bedrock, rocky soil, DSC, DAR, DCA, RIO, 1800–3800 ft; *JF 686, 1061, 1593, 1669, 2064; BHW 10834* (SRSC); *DSC & HBC 30626, BHW 10834* (TEX-LL).

Brickellia eupatorioides (L.) Shinners var. *chlorolepis* (Woot. & Standl.) B.L. Turner, False boneset, rare subshrub, DSC, DAR, 4280 ft; *BA2 5510* (SAT & TEX-LL); *JF 1041* (SRSC).

Brickellia laciniata Gray, Splitleaf brickellia, occasional shrub, DAR, DCA, 1850–3050 ft; *BA2 5483* (SAT & TEX-LL); *JF 1084, 1146* (SRSC).

● *Brickellia lemmonii* var. *conduplicata* (B.L. Rob.) B.L. Turner, Lemmon brickellbush, uncommon perennial herb, DCA, 4650 ft; *BA2 5441, DG 328, 329* (SAT); *JF 1944, 1949* (SRSC); *BA2 5455, BA2 & TE 5441* (TEX-LL).

\+ *Chaetopappa bellioides* (Gray) Shinners, Manyflower least-daisy, rare perennial herb, DSC, 2680 ft; *JF 190* (SRSC).

\+ *Chaetopappa ericoides* (Torr.) Nesomn [*Leucelene ericoides* (Torr.) Greene], Rose heath, leucelene, rare annual or perennial herb, SYG, 5000–5300 ft; *JF 773, 2157* (SRSC).

Chloracantha spinosa (Benth.) Nesom, [*Aster spinosus* Benth., *Erigeron ortegae* S.F. Blake], Mexican devilweed, occasional

perennial herb, RIO, 1800 ft; *BA2, DG, TE, & B 4922* (BIBE); *JF 2019a* (SRSC).

Chrysactinia mexicana A. Gray, Damianita, common subshrub at higher elevations, DCA, SYG, CHP, 4080–5200 ft; *SMU 52* (BGWMA); *PVW s.n.* (KANU); *BA2 5297* (SAT); *JF 572, MT 223* (SRSC); *BA2 & TE 5297* (TEX-LL).

Cirsium turneri Warnock, Cliff thistle, uncommon perennial herb, DCA, 2920–4200 ft; *AL 163* (BIBE); *JF 187, 1121, 1704, AMP & SAP 5126, MT 215* (SRSC); *JF 1121* (TEX-LL).

§ *Conyza canadensis* (L.) Cronq., Canadian horseweed, annual herb; *EGM 142* (BIBE).

Diaperia verna (Raf.) Morefield, [*Evax verna* Raf.; *Evax multicaulis* DC.], Manystem evax, rare annual herb, DSC, DAR, 2400–2520 ft; *JF 1429* (SRSC); *RRI 555* (TEX-LL).

Dyssodia acerosa DC., [*Thymophylla acerosa* (DC.) Strother], Prickleleaf dogweed, common perennial herb, DSC, DAR, DCA, 2150–4400 ft; *BHW & LCH BG-72* (BGWMA); *JF 512, 1588, MT 72, BHW & LCH BG-72, GLW 4447* (SRSC); *BA2, DG & TE 5505* (TEX-LL).

Dyssodia micropoides (DC.) Loes., [*Thymophylla micropoides* (DC.) Strother], Wooly dogweed, uncommon perennial herb, DSC, 2350–2560 ft; *AL 316, 317* (BIBE); *JF 1401, 1684* (SRSC); *BA2, DG & TE 5461* (TEX-LL).

Dyssodia pentachaeta (DC.) B.L. Robins., [*Thymophylla pentachaeta* (DC.) Small var. *pentachaeta*], Prickly dogweed, occasional perennial herb, DSC, DAR, DCA, SYG, 1800–5150 ft; *CMR 5056* (BGWMA); *BA2, DG, TE, & PC 4599* (BIBE); *PVW s.n.* (KANU); *JF 192, 320, 460, 540c, 542, 576, 1033, 1085, 1226, 1228, 1927, 2108, HTF 1230, MT 62, 242, BHW 10817* (SRSC); *BA2 & TE 5295, 5296* (TEX-LL).

§ *Eclipta prostrata* (L.) L., [*Eclipta alba* (L.) Hassk.], False daisy, "infrequent to frequent" annual or perennial herb, RIO, 1800–1825 ft; *BHW 13039* (BIBE, SRSC, TEX-LL); *BHW 13035* (TEX-LL).

Erigeron flagellaris A. Gray, Trailing fleabane, uncommon biennial herb, 3300–4600 ft; *JF 754, 799, AMP & SAP 5129, MT 78* (SRSC).

Erigeron modestus Gray, Plains fleabane, uncommon perennial herb, DSC, DAR, 3460 ft; *VLC 43989; JF 264, 373, MT 249* (SRSC); *BA2 & TE 5324, BA2, TE & DG 5494* (TEX-LL).

Erigeron tracyi Greene, [*Erigeron colomexicanus* A. Nels.], Running fleabane, occasional annual herb, DSC, DAR, DCA, SYG, 2880–5150 ft; *JF 1025* (BIBE); *JF 763, 1008, 1025, 1153, 1231, 1272, BLT & BD 23-170, BHW 10833* (SRSC); *BLT & BD 23-170* (TEX-LL).

§ *Flaveria trinervia* (Spreng.) C. Mohr, Running yellowtops, "frequent" annual herb, RIO, 1800 ft; *EGM 132, BHW 750, 13042* (BIBE); *BHW 13042* (SRSC); *EGM 132, BHW 750* (TEX-LL).

§ *Flourensia cernua* DC., Tarbush, rare shrub; *BA2 5520* (TEX-LL).

§ *Flyriella parryi* (Gray) King & H.E. Robins., Chisos mountains brickellbush, "infrequent" perennial herb; *BHW 18403* (SRSC).

Grindelia arizonica Gray, Arizona gumweed, annual or perennial herb, SYG, 4280 ft; *JF 1043* (SRSC).

§● *Grindelia nuda* Wood var. *nuda*, Curlytop gumweed, annual or perennial herb, DAR; *BA2 & TE 5355* (TEX-LL).

Gutierrezia microcephala (DC.) Gray , Threadleaf snakeweed, occasional to locally common subshrub, DAR, DCA, DSC, SYG, 2500–5840 ft; *JF 1324a, MT 45, 219, 252* (SRSC); *BA2, DG, & TE 5521, TR 251* (TEX-LL).

Gutierrezia sarothrae (Pursh) Britt. & Rusby, Broom snakeweed, common subshrub, DSC, DAR, DCA, RIO, SYG, 1800–5100 ft; *BA2, DG, B & TE 4921, JF 1411* (BIBE); *PVW s.n.* (KANU); *JF 318, 1411, 1417, TR 251, BLT & BD 23-179* (SRSC).

Gutierrezia sphaerocephala Gray, Roundleaf snakeweed, uncommon subshrub, DSC, DAR, SYG, 2400–4280 ft; *JF 1411a, OES 763* (SRSC); *BLT & BD 23-179* (TEX-LL).

Gymnosperma glutinosum (Spreng.) Less., [*Xanthocephalum glutinosum* (Spreng.) Shinners], Tatalencho, gumhead, common subshrub, DSC, DAR, DCA, SYG, 2350–5300 ft; *OCW 339* (BGWMA); *JF 238, 321, 498a, 579, 712, 752, 1181, 1376, 1989, OCW 339* (SRSC); *BA2 & TE 5323, BA2, DG & TE 5515* (TEX-LL).

§ *Helenium elegans* DC. var. *amphilobum* (Gray) Bierner, Pretty sneezeweed, annual herb, RIO, 1800 ft; *MWB & JEA 232a, 232c, 232d* (TEX-LL).

§ *Helenium microcephalum* DC. var. *microcephalum*, Smallhead sneezeweed, "frequent" annual herb, RIO, 1800 ft; *AL 322, CN 504* (BIBE); *BHW 13031* (SRSC); *OES & CN 504, BHW 13031* (TEX-LL).

§ *Helenium microcephalum* DC. var. *ooclinium* (Gray) Bierner, [*Helenium ooclinium* A. Gray], annual herb, RIO, 1800 ft; *MWB & JEA 232b, 232e* (TEX-LL).

Helianthus annuus L., Common sunflower, "frequent" annual herb, RIO, 1800 ft; *EGM 129, BHW 13045* (BIBE); *JF 2263, BHW 13045* (SRSC).

§ *Helianthus ciliaris* DC., Texas blueweed, "locally frequent" perennial herb, RIO, 1800 ft; *BHW 13051* (BIBE & SRSC).

Heliopsis parvifolia Gray, Mountain oxeye, rare perennial herb, SYG/CHP, 5680 ft; *JF 1276* (BIBE & SRSC).

§ *Isocoma pluriflora* (Torr. & Gray) Greene, [*Haplopappus heterophyllus* (A. Gray) S.F. Blake; *Haplopappus pluriflorus* (Torr. & A. Gray) H.M. Hall], Jimmyweed, subshrub, DSC; *BHW 1076* (TEX-LL).

Iva ambrosiifolia (Gray) Gray, Rag sumpweed, ragged marshelder, rare annual herb, DSC, DAR, 3640 ft; *JF 289* (SRSC); *BA2, DG, & TE 5492* (TEX-LL).

Jefea brevifolia (A. Gray) Strother, [*Zexmenia brevifolia* A. Gray], Shorthorn zexmenia, occasional shrub, DSC, DCA, SYG, 1800–4700 ft; *PVW s.n.* (KANU); *JF 472, 708, 2132, CMR 5068, MT 106, BHW 10736* (SRSC); *BA2, DG, & TE 5503, BA2 & TE 5298, DF 223, BHW 10763* (TEX-LL).

+ *Laennecia coulteri* (Gray) Nesom, [*Conyza coulteri* A. Gray], Coulter horseweed, annual horsetail, rare annual herb, DCA, 2400 ft; *JF 1420* (SRSC).

+○ *Machaeranthera tanacetifolia* (Kunth) Nees, Tahoka daisy, rare annual herb; DAR, 3480 ft; *JF 544* (SRSC).

Melampodium leucanthum Torr. & A. Gray, Blackfoot daisy, occasional subshrub, DSC, DAR, DCA, RIO, SYG, 1800–4450 ft; *JF 228, 269, 490, 967, 2006, 2123, MT 4, 47, 58, 74, 238, BLT & BD 23-176, BHW & BLT 8328, GLW 4483* (SRSC); *BLT & BD 23-176* (TEX-LL).

+ *Packera millelobata* (Rydb.) W.A. Weber & A. Löve, Uinta ragwort, rare perennial herb, SYG/CHP, 5680–5840 ft; *JF 1287, 1971* (SRSC).

Parthenium argentatum A. Gray, Guayule, locally uncommon to occasional, DSC, SYG, 2920–4880 ft; *BHW & LCH BG-177* (BGWMA); *JF 1024, BDGL s.n.* (BIBE); *PVW s.n.* (KANU); *JF 744, 1024, 1139, 1155, 1183, 1901, JMM 888, 900, 903, AMP & SAP 4297, MT 49, BHW 10753* (SRSC); *BHW 10753* (TEX-LL).

Parthenium confertum A. Gray, Lyreleaf parthenium, uncommon to occasional annual or biennial herb, DSC, DAR, DCA, 1850–5840 ft; *JF 206, 359a, 524, 852, 1068, 1083, 1433, 1907, DM & JC 380, 900, 904, MT 41, 254, BHW 20608, BHW & MCJ 16836* (SRSC); *BA2 & TE 5304* (TEX-LL).

Parthenium incanum Kunth, Mariola, common shrub, DSC, DAR, DCA, SYG, 2300–5000 ft; *JF 350, 1023, OCW 511* (SRSC); *BA2 & TE 5303* (TEX-LL).

§ *Pectis angustifolia* Torr. var. *angustifolia*, Limoncillo, "frequent" annual herb; *BHW & BLT 8323* (SRSC); *VLC 30209, DF 224* (TEX-LL).

§ *Pectis papposa* Harvey & Gray var. *grandis* Keil, Manybristle cinchweed, "frequent in sandy soil" annual herb, 1800 ft; *BHW 286* (SRSC); *BHW & BLT 8323* (TEX-LL).

Perityle aglossa A. Gray, Bluff rockdaisy, occasional subshrub, cracks, DSC, DCA, 1850–3560 ft; *AL 141* (BIBE); *JF 184, 530, 650, 685, 1005, 1007, 1073, 1350, 2014, SS 38, 931, BHW 20409* (SRSC); *SS 931* (TEX-LL).

Perityle bisetosa (Torr. ex A. Gray) Shinners var. ***scalaris*** A.M. Powell, Stairstep rockdaisy, uncommon to occasional (G2T1S1) subshrub, DCA, SYG, CHP, 3050–5680 ft; *AL 146* (BIBE); *JF 475, 608a, 1123, 1289, 1917, BHW 20604* (SRSC); *JMP 2742* (TEX-LL).

Perityle vaseyi J.M. Coult., Vasey rockdaisy, rare subshrub, rocky soil; DSC, DAR, 2080–2350 ft; *JF 1367, SS 39, TRV & LJT 1816* (SRSC); *SS 39* (TEX-LL).

+ *Plectocephalus americanus* (Nutt.) D. Don [*Centaurea americana* Nutt.], American basketflower or star-thistle, rare annual herb, DSC, DAR, 3550–4420 ft; *JF 507a, 843* (SRSC).

Porophyllum scoparium A. Gray, Shrubby poreleaf, occasional subshrub, DSC, DAR, DCA, RIO, 1800–4000 ft; *BRM 3132, 3227, CMR 11592, SMU 38* (BGWMA); *JEA & TJW 170, JF 332, 471, 645, 1379, 2081, BGH 633, OES 1351, MT 184, BHW 18396, 20618, 21191* (SRSC); *BA2 & TE 5336, BA2 & DG 5207, DSC & HBC 30633, DF 51* (TEX-LL).

Psilostrophe gnaphalioides DC., Cudweed paperflower, rare to "infrequent" perennial herb, DSC, 1900 ft; *JF 2044, BHW 20627* (SRSC).

Psilostrophe tagetina (Nutt.) Greene var. *cerifera* (A. Nels.) B.L. Turner, Wooly paperflower, uncommon perennial herb, DSC, DAR, 2300–3560 ft; *JF 523, 605, 855, MT 17, 18, BHW 10788, 18390, GLW 4470* (SRSC); *BA2 & TE 5362, TRV 85-37* (TEX-LL).

+ *Senecio flaccidus* Less. var. *flaccidus*, [*Senecio douglasii* DC.], Threadleaf groundsel, rare perennial herb, DSC, DAR, 2400–3560 ft; *JF 513, 1431* (SRSC).

*§ *Sonchus asper* (L.) Hill, Prickly sow thistle, annual herb, RIO, 1800 ft; *BA2 4320* (BIBE).

*§ *Sonchus oleraceus* L., Sow-thistle, "frequent" annual herb, RIO; *BHW 733* (BIBE & TEX-LL); *HTF 209* (SRSC).

+ *Stephanomeria pauciflora* (Torr.) A. Nelson, Brownplume wirelettuce, rare perennial herb, DCA, 2350 ft; *JF 1358* (SRSC).

§ *Symphyotrichum divaricatum* (Nutt.) G.L. Nesom, [*Symphyotrichum subulatum* var. *ligulatum* (Shinners) S.D. Sundb.], Southern saltmarsh aster, annual herb; *EGM 134, BHW 730* (BIBE).

Symphyotrichum expansum (Poepp. ex Spreng.) Nesom, [*Symphyotrichum subulatum* var. *ligulatum* (Shinners) S.D. Sundb.], Southwestern saltmarsh aster, occasional annual herb, RIO, 1800 ft; *JF 2037, BHW 13044* (SRSC).

Tetraneuris scaposa (DC.) Greene var. *scaposa*, Stemmy four nerve daisy, occasional perennial herb, DSC, DAR, DCA, 2150–5840 ft; *CMR 5088* (BGWMA); *BHW 12895* (BIBE); *JF 258, 524a, 614, 739, 755, 1052, 1234, 1247, 1374, 1403, 1970, MT 79, 233, BHW 10850, 12895, BHW & LCH BG-67* (SRSC); *BA2 & TE 5300, 5434, BHW 12895* (TEX-LL).

§ *Thelesperma filifolium* (Hook.) Gray, Stiff greenthread, annual herb, 3520 ft; *ACK 826* (BIBE).

Thelesperma longipes A. Gray, Longstalk greenthread, occasional perennial herb, DSC, DAR, DCA, SYG, CHP, 1800–5150 ft; *BRM 3140; CMR 5083, 16949* (BGWMA); *BHW 12892* (BIBE, SRSC, & TEX-LL); *JF 761, 1233, 1394, 2125, BHW & LCH BG-73* (SRSC); *BA2 & TE 5325, OES 734, BHW & LCH BG-73* (TEX-LL).

Thelesperma megapotamicum (Spreng.) Kuntze var. *megapotamicum*, Rayless greenthread, uncommon perennial herb, DSC, DAR, DCA, RIO, SYG, 1800–4800 ft; *CMR 5084* (BGWMA); *JF 164, 262, 263, 1389, 2167* (SRSC); *DSC & HBC 30634, JAM & JAS 3429, AMP & SAP 3610* (TEX-LL).

§ *Thelesperma megapotamicum* (Spreng.) Kuntze var. *ambiguum* Gray, Colorado greenthread, occasional perennial herb, DAR, DCA, RIO, 1800 ft; *AMP & SAP 3610, BHW 21189, GLW 4476* (SRSC).

● *Thelesperma simplicifolium* Gray, Slender greenthread, uncommon perennial herb, DCA, 1900–4180 ft; *CMR 324, OCW 3243, BHW & LCH BG-68* (BGWMA); *JF 865, MT 63, 151, 163, AMP & SAP 5135, OCW 324, BHW 21185, BHW & LCH BG-68* (SRSC).

Trixis californica Kellogg var. *californica*, American trixis, occasional shrub, DSC, DAR, DCA, 1800–4160 ft; *JF 473, 649, 1062, 1079, 1314, 2003, 2114, BHW 10751, GLW 4455* (SRSC); *BA2, DG, & TE 5493* (TEX-LL).

Verbesina encelioides (Cav.) Benth. & Hook. f. ex A. Gray, Golden crownbeard, uncommon annual herb, DCA, RIO, 1000–2560 ft; *EGM 138, OES 746* (BIBE); *JF 1066, 2036* (SRSC).

Viguiera dentata (Cav.) Spreng., Sunflower goldeneye, uncommon to "frequent and widespread" perennial herb, DAR, SYG, CHP, 3500–5150 ft; *BHW & LCH BG-15* (BGWMA); *JF 291, 759, 1028, 1224, MT 234, BHW & LCH BG-155* (SRSC).

Viguiera stenoloba S.F. Blake, Skeletonleaf goldeneye, common shrub, DSC, DAR, DCA, SYG, CHP, 1800–5000 ft; *TR 56, CMR 16939, BHW & LCH BG-86* (BGWMA); *JF 260, 1029, 1370, 2140, TR 56, MT 145, 173, BHW & LCH BG-86* (SRSC); *BA2 & TE 5302* (TEX-LL).

§ *Xanthisma spinulosum* (Pursh) D.R. Morgan & R.L. Hartman *var. spinulosum*, [*Haplopappus spinulosus* (Pursh) DC.; *Machaeranthera pinnatifida* (Hook.) Shinners], Lacy tansyaster, cutleaf goldenweed, "fairly common" perennial herb, DSC, DAR; *GLW 4469* (SRSC); *BA2 & TE 5389, BA2 & DG 5272* (TEX-LL).

Xanthisma spinulosum (Pursh) D.R. Morgan & R.L. Hartman *var. chihuahuanum* (B.L. Turner & R. L. Hartman) D.R. Morgan & R.L. Hartman, [*Machaeranthera pinnatifida* var. *chihuahuana* B.L. Turner & Hartman], Lacy tansyaster, occasional perennial herb, DSC, DCA, RIO, 2300–3050 ft; *JF 800, 958, 1130, 1373, MT 207, 210, BHW 18391* (SRSC); *RLH & JDB 3504b, 3503* (TEX-LL).

Xylothamia triantha (Blake) Nesom, [*Ericameria triantha* (S.F. Blake) Shinners], Trans-Pecos desert goldenrod, rare subshrub, DSC, DAR, 2400 ft; *JF 1450* (SRSC).

Zinnia acerosa (DC.) A. Gray, Spinyleaf zinnia, common perennial herb, DSC, SYG, 2760–4400 ft; *BRM 3228, BHW & LCH BG-142* (BGWMA); *JF 153, 851, 1094, 1180, MT 5, 59, BHW 10837, BHW & LCH BG-142* (SRSC); *BH2 & TE 5294, BHW 10837* (TEX-LL).

Berberidaceae

\+ *Berberis trifoliolata* Moric., Agarita, algerita, uncommon to occasional shrub, DSC, DAR, DCA, SYG, 2880–4600 ft; *JF 508, 528, 1001, 1036* (SRSC).

Bignoniaceae

Chilopsis linearis (Cav.) Sweet, Desertwillow, uncommon shrub or tree, DCA, 1800–4280 ft; *TR 140* (BGWMA); *BA2 5234* (SAT); *JF 1355, 1356, 2137, TR 140, MT 189* (SRSC).

Tecoma stans (L.) Juss. ex Kunth, Yellow bells, occasional shrub, DSC, DAR, DCA, 1800–3050 ft; *TR 141* (BGWMA); *BA2 5331* (SAT); *JF 179, 1010, TR 141, MT 11 193, BHW & LCH BG-85, BHW & MCJ 16866* (SRSC); *BLT & MT2 97-347, BHW & LCH BG-85* (TEX-LL).

Boraginaceae

● *Antiphytum heliotropioides* A. DC., Mexican saucerflower, rare to "locally common" shrub, DAR, DCA, 4200–4350 ft; *BA2 5220, 5313, 5453, 5465, 5600* (SAT); *JF 1936* (SRSC).

+○ *Cryptantha albida* (Kunth) I.M. Johnst., New Mexico cryptantha, rare annual herb, DCA, 1920–3000 ft; *JF 646, 805* (SRSC).

Cryptantha angustifolia (Torr.) Greene, Panamint cryptantha, rare annual herb, DSC, 2560–3560 ft; *JF 522* (SRSC); *RRI 552* (TEX-LL).

Cryptantha coryi I.M. Johnst. [*Cryptantha palmeri* (A. Gray) Payson],Cory cryptantha, rare subshrub, DSC, 3560 ft; *JF 280* (SRSC); *BLT & BD 23-164* (TEX-LL).

#Δ○ *Cryptantha crassisepala* (Torr. & A. Gray) Greene, Thicksepal catseye, annual herb, 1800 ft at the Boquillas Canyon restoration site.

§ *Cryptantha mexicana* (Brandegee) I.M. Johnst., Mexican cryptantha, "infrequent" annual herb, 2300 ft; *OCW 506* (SRSC).

Heliotropium confertifolium (Torr.) Torr. ex A. Gray, Leafy heliotrope, occasional subshrub, DSC, 1800–3800 ft; *EGM 147, BHW 907, 940* (BIBE); *JF 155, 367, BHW s.n., 940, 10848, BHW & LCH BG-76* (SRSC); *BHW s.n., 10848; BHW & LCH BG-76* (TEX-LL).

Heliotropium convolvulaceum (Nutt.) A. Gray, Phlox heliotrope, locally common annual herb, RIO, DSC, 1800 ft; *BA2, DG, TE, & PC 4608, BHW 13029* (BIBE); *WRC & PM212200, JF 2232, AMP & SAP 5860, BHW 686, 13029, 16851, GLW 4474* (SRSC); *DSC & HBC 30631, BHW 686* (TEX-LL).

Heliotropium curassavicum L. var. *curassavicum*, Salt heliotrope, locally common subshrub, RIO, 1800 ft; *EGM 124, 943, CN 495* (BIBE); *JF 2256, BCT 8802* (SRSC); *BCT 8802, BHW 943* (TEX-LL).

#Δ *Heliotropium glabriusculum* (Torr.) A. Gray, Greeneye heliotrope, perennial herb, 1800 ft, head of Boquillas Canyon.

§ *Heliotropium greggii* Torr., Fragrant heliotrope, perennial herb, 1800 ft; *DSC & IMJ 21926* (SRSC).

§ *Heliotropium procumbens* Mill., Fourspike heliotrope, subshrub; *BHW 1089* (TEX-LL).

Lappula redowskii (Hornem.) Greene,[*L. occidentalis* (S. Wats.) Green] Flatspine stickseed, occasional annual herb, DAR, DCA, 1800–3560 ft; *DB 22, TK 10, BRM 3124* (BGWMA); *JF 427, 540a, 797, 2101, BHW 47057, 47059* (SRSC).

+● *Lithospermum incisum* Lehm., Fringed puccoon, narrowleaf stoneseed, rare perennial herb, SYG, 4360–4800 ft; *BA2 5539, 5597* (SAT); *JF 554, 1948* (SRSC).

§ *Omphalodes aliena* A. Gray ex Hemsl., Mexican navelwort, "frequent" annual herb, DSC, DCA, RIO, 1800–2560 ft; *BRM 3131* (BGWMA); *JLB 1578, ECM 49* (SAT); *AMP 5367, BHW 15991, 18395* (SRSC); *DSC & WOD 30715* (TEX-LL).

§ *Tiquilia canescens* (DC.) A.T. Richardson var. *canescens*, Woody crinklemat, occasional subshrub, DSC, 2200–2400 ft; *BA2 5340* (SAT); *TR 4* (SRSC); *TR 4, BHW 1230* (TEX-LL).

Tiquilia gossypina (Wooton & Standl.) A.T. Richardson, Texas crinklemat, occasional subshrub, DSC, DCA, 1800–3440 ft; *JF 360, 2059, BHW 12899* (SRSC); *BHW 909* (TEX-LL).

Tiquilia greggii (Torr.) A.T. Richardson, Plume tiquilia, occasional shrub, DSC; *CMR 11634* (BGWMA); *BA2 5270* (SAT); *JF 359, 369*; *MT 213, BHW 10800* (SRSC).

§ *Tiquilia hispidissima* (Torr.) A.T. Richardson, Rough coldenia, occasional subshrub, DSC, 1850–3520 ft; *BA2, DG, TE, & B 4923, ACK 822, BHW 908, 909* (BIBE); *BLT & BD 23-162, BHW 21682, 21692* (TEX-LL).

Tiquilia mexicana (S. Watson) A.T. Richardson, Mexican crinklemat, occasional subshrub, 1800–3400 ft; *JF 152a, 812, 1443, BHW 13072, 23038, GLW 4487* (SRSC).

Brassicaceae

Descurainia pinnata (Walter) Britton, Tansymustard, uncommon annual herb, DSC, DAR, DCA, 3440–3500 ft; *BA2 5587* (SAT); *JF 422, 617* (SRSC).

§ *Dimorphocarpa wislizeni* (Engelm.) Rollins, Spectacle pod, touristplant, locally common annual herb, DCA, 3500 ft; *BHW 47060* (SRSC & TEX-LL); *VLC 43958, RRI 558* (TEX-LL).

Draba cuneifolia Nutt. ex Torr. & A. Gray, Wedgeleaf draba, occasional annual herb, DSC, DAR, DCA, SYG, 1800–5080 ft; *JF 429, 536, 566, 738, 802, BHW 18392, BHW & MCJ 15990* (SRSC); *BHW & MCJ 15990* (TEX-LL).

§ *Lepidium alyssoides* A.Gray var. *angustifolium* (C.L. Hitchc.) Rollins, Mesa pepperwort, perennial herb; *HBP 1923* (TEX-LL).

Lepidium lasiocarpum Nutt. ex Torr. & A. Gray var. *wrightii* (A. Gray) Thell., Wright pepperweed, uncommon annual herb, DAR, DCA, 3440–3560 ft; *JF 619* (BIBE); *BA2 734, 5540, 5586; RE 734* (SAT); *JF 421, 565, 619* (SRSC).

Nerisyrenia camporum (A. Gray) Greene, Bicolored mustard, common perennial herb, DSC, DCA, SYG, 2120–4280 ft; *CMR*

16047 (BGWMA); *JF 492* (BIBE); *JF 372, 492, 615, 681, MT 105BHW 208, 47054, BHW & HKB 47063* (SRSC); *BHW T208, 47063* (TEX-LL).

Physaria fendleri (A. Gray) O'Kane & Al-Shehbaz, Fendler bladderpod, occasional perennial herb, DSC, DAR, DCA, SYG, 2200–5000 ft; *JF 557* (BIBE); *TR 105* (BGWMA); *JF 200, 497a, 555, 557, 736, 1189, TR 139, MT 75, 104, BHW 47062* (SRSC).

\+ *Physaria gordonii* (A. Gray) O'Kane & Al-Shehbaz, Gordon bladderpod, rare annual herb, SYG, 4360 ft; *JF 570* (SRSC).

Physaria mcvaughiana (Rollins) O'Kane & Al-Shehbaz, Mcvaugh bladderpod, rare perennial herb, SYG, 4120–5840 ft; *JF 497, 714, 1535, 1964, AMP & SAP 5133* (SRSC).

§ *Physaria purpurea* (Gray) O'Kane & Al-Shehbaz [*Lesquerella purpurea* (A. Gray) S. Watson], Rose bladderpod, "frequent" perennial herb; *BHW & MCJ 15995* (SRSC).

Schoenocrambe linearifolia (A. Gray) Rollins, Slimleaf plainsmustard, rare perennial herb, SYG, 3500–5680 ft; *BRM 3110* (BGWMA); *JF 734, 1291, 2185, MT 42, 43, 246, BHW & LCH BG-154* (SRSC).

§ *Selenia dissecta* Torr. & A. Gray, Texas selenia, "frequent" annual herb, DCA, 3500 ft; *CMR 16410* (BGWMA); *BHW 47058, BHW & MCJ 15989* (SRSC); *BHW 47058* (TEX-LL).

*§● *Sisymbrium irio* L., London rocket, annual herb, DCA, 2560 ft; *RRI 551* (TEX-LL).

Streptanthus cutleri Cory, Cutler twistflower, uncommon (G2S2) biennial herb, DSC, DAR, DCA, 1800–3500 ft; *JF 420, AMP 3570, 5366, AMP & SAP 4299, 5387, BHW 18399, BHW & MCJ 15992* (SRSC).

§ *Thelypodium texanum* (Cory) Rollins, Texas thelypody, annual herb; *OES 1288* (SRSC).

§ *Thelypodium wrightii* A. Gray, Wright thelypody, perennial herb, DCA; *BRM 3106* (BGWMA).

Cactaceae

Ariocarpus fissuratus (Engelm.) K. Schum., Living rock cactus, common succulent, DSC, SYG, 3350–ca. 4500 ft; *BA2 5278, DB 468* (SAT); *JF 274, 1479, DS2 12b* (SRSC).

§ *Coryphantha dasyacantha* (Engelm.) Orcutt., Desert pincushion cactus, succulent, 4125 ft; *MT 90* (SRSC).

Coryphantha duncanii (Hester) L.D. Benson, [*Escobaria dasyacantha* var. *duncanii* (Hester) N.P. Taylor], Duncan cory cactus, rare (G3T1T2S1S2) succulent, DSC, ca. 2000–4146 ft; *JF 549, JF & MD 612, AMP 5373, DS2 2228* (SRSC).

Coryphantha echinus (Engelm.) Britton & Rose var. *echinus*, [*Mammillaria scolymoides* Scheidw.], Sea-urchin cactus, occasional succulent, rocky soils, open desert and slopes, DSC, SYG, 3500–4360 ft; *JF 593, 868, 1493, BHW 11061* (SRSC).

Coryphantha echinus (Engelm.) Britton & Rose var. *robusta* A.M. Powell, Multi-stemmed sea-urchin cactus, rare succulent, DSC, 2400–3650 ft; *JF 1440, 1494* (SRSC).

Coryphantha sneedii (Britton & Rose) A. Berger var. ***albicolumnaria*** (Hester) A.D Zimmerman, Silverlace cactus, [*Coryphantha albicolumnaria* (Hester) Zimmerman; *Corphantha sneedii* var. *albicolumnaria* (Hester) A.D. Zimmerman (forthcoming, cited in Powell and Weedin 2004); *Escobaria albicolumnaria* Hester], rare (G2G3S2S3) succulent, DSC, SYG, 1800–4840 ft; *DAZ 1541* (BIBE); *JF 556, 587, 588* (SRSC).

Coryphantha tuberculosa (Engelm.) A. Berger var. *tuberculosa*, [*Mammillaria tuberculosa* Engelm.], Cob cactus, common succulent, DSC, DCA, SYG, 1900–5840 ft; *CMR s.n.* (BGWMA); *JF 273, 386, 550, 625, 781, 1300, MT 89* (SRSC).

§ *Coryphantha tuberculosa* (Engelm.) A. Berger var. *varicolor* (Tiegel) A.D. Zimmerman, [*Coryphantha dasyacantha* var. *varicolor* (Tiegel) L.D. Benson], Varicolor cob cactus, succulent; *BA2 471* (SAT).

Echinocactus horizonthalonius Lem., Eagle claw cactus, occasional succulent, DSC, DCA, SYG, 4360 ft; *CMR 5173* (BGWMA); *DB 470* (SAT); *JF 591* (SRSC).

Echinocereus dasyacanthus Engelm., Rainbow cactus, common succulent, DSC, SYG, 1900–5700 ft; *DB 469* (SAT); *JF 558, 623* (SRSC).

\+ *Echinocereus enneacanthus* Engelm. var. *enneacanthus*, Strawberry cactus, occasional succulent, DSC, 1800 ft; *JF 2148* (SRSC).

+○ *Echinocereus stramineus* (Engelm.) Rumpler var. *stramineus*, Strawberry pitaya, common succulent, DSC, DCA, SYG, 1800–4440 ft; *JF 780, 2149* (SRSC).

Echinomastus mariposensis Hester, [*Neolloydia mariposensis* (Hester) L.D. Benson; *Sclerocactus mariposensis* (Hester) N.P. Taylor], Mariposa cactus, occasional (G2S2; LT/T) succulent, DSC, DCA, 3300–3520 ft; *CMR 5172* (BGWMA); *JF 391, 624, AMP & SAP 5925, DS2 2221* (SRSC).

Echinomastus warnockii (L.D. Benson) Glass & R. Foster, [*Sclerocactus warnockii* (L.D. Benson) N.P. Taylor], Warnock cactus, occasional succulent, DSC, DCA, 1900–2560 ft; *JF 2150, BHW 47459, BHW & HKB 47012* (SRSC).

\+ *Epithelantha micromeris* (Engelm.) F.A.C. Weber ex Britton & Rose, Common button cactus, uncommon succulent, DSC, SYG, 3560–4140 ft; *JF 268a, 271, 586, 613, 613a, 1486* (SRSC).

Ferocactus hamatacanthus (Muehlenpf.) Britton & Rose var. *hamatacanthus*, Giant fishhook cactus, occasional succulent, DCA, SYG, 4300–4900 ft; *CMR 5174* (BGWMA); *JF 590, 1507, MT 96* (SRSC).

Glandulicactus uncinatus var. *wrightii* (Engelm.) Backeb., [*Ancistrocactus uncinatus* var. *wrightii* (Engelm.) L.D. Benson; *Echinocactus uncinatus* Galeotti ex Pfeiff.; *Ferocactus uncinatus* (Galeotti ex Pfeiff.) Britton & Rose], Eagle claw cactus, uncommon succulent, DSC, SYG, 3520–4040 ft; *DS2 03b, JF 548* (SRSC).

§ *Mammillaria heyderi* Muehlenpf. var. *heyderi*, Heyder pincushion cactus, "rare" succulent, DSC, 2500 ft; *AMP, SAP, MLP, & AL2 6103* (SRSC).

§ *Mammillaria lasiacantha* Engelm., Golf ball cactus, succulent, DSC, ca. 3520 ft; *DS2 18b, 2222, JFW s.n.* (SRSC).

§ *Mammillaria meiacantha* Engelm., Nipple cactus, succulent; *BHW 11065* (SRSC).

Neolloydia conoidea (DC.) Britton & Rose, Texas cone cactus, occasional to locally abundant succulent, SYG, 3080–5200 ft; *JF 380, 782, DS2 2220, MT 52, 53, 122, BHW 11055, 11058* (SRSC).

Opuntia aggeria Ralston & Hilsenb., Clumped dog cholla, common succulent at lower elevations, DSC, 1850–300 ft; *JF 635, 640, 691, 704, 1562, 1563, 1574, 1574a, 1576, 1620, BAR & RAH 136* (SRSC).

Opuntia azurea Rose var. ***aureispina*** (S. Brack & K.D. Heil) A.M. Powell & J.F. Weedin, [*Opuntia aureispina* (S. Brack & K.D. Heil) Pinkava & B.D. Parfitt], Golden-spined prickly pear, G1S1 succulent, RIO, 1800 ft; *JF 384, BGH 802* (SRSC).

\+ *Opuntia camanchica* Engelm. & J.M. Bigelow, Comanche prickly pear, succulent, DSC, DAR, 3560 ft; *MA 848, JF 626* (SRSC).

§ *Opuntia densispina*, Densely-spined dog cholla, succulent; *DOK & JFW 53, AMP & SAP 6275* (SRSC).

Opuntia dulcis Engelm., Sweet prickly pear, succulent, DSC, 1800–3560 ft; *JF* 628; *AMP & SAP 6278; MPG 87, 88, 89* (SRSC).

+○ *Opuntia engelmannii* Salm-Dyck ex Engelm. var. *engelmannii*, Engelmann prickly pear, uncommon succulent, SYG, 4440 ft; *JF 589* (SRSC).

§ *Opuntia engelmannii* var. *lindheimeri* (Engelm.) B.D. Parfitt & Pinkava, Texas prickly pear, succulent, DSC, 1800 ft; *AMP & SAP 6277, JFW 1171* (SRSC).

*§ *Opuntia ficus-indica* (L.) Mill., Indian fig, rare succulent; *BGH 646* (SRSC).

Opuntia grahamii Engelm., Graham dog cholla, occasional succulent, DSC, 3000–3520 ft; *CMR 5178* (BGWMA); *MA 892* (BIBE); *JF 333, 377, 378, 389, 783, 892, 1142a* (SRSC).

Opuntia kleiniae DC., Candle cholla, occasional succulent, RIO, 1800 ft; *BGH 841, JF 2040* (SRSC).

Opuntia leptocaulis DC., Tasajillo, christmas cactus, occasional succulent, DSC, DAR, 3360–4120 ft; *JF 388, 448, 816, WH, TA, LS & JMP 9028* (SRSC).

Opuntia rufida Engelm., Blind prickly pear, common succulent, DSC, DAR, DCA, 1800–3560 ft; *JF 627, BGH 803, WH, TA, LS & JMP 8985* (SRSC).

Opuntia spinosibacca M.S. Anthony, Spiny-fruited prickly pear, succulent, DSC, 1800–4600 ft; *MA A-3, A-7, JF 385, BGH 801, 842, AMP & SAP 5824, 6089* (SRSC).

Opuntia sp., Prickly pear; *BGH 800, 840; AMP & SAP 6276* (SRSC).

Capparidaceae

Koeberlinia spinosa Zucc., Allthorn, occasional shrub, DSC, DAR, DCA, 2500–3800 ft; *WFM s.n., CMR 32* (BGWMA); *JF 1441, JF & HL 1891, MT 8* (SRSC).

Caprifoliaceae

Lonicera albiflora Torr. & A. Gray, Western white honeysuckle, rare perennial woody vine, SYG/CHP, DCA, 4280–5680 ft; *BRM 3230* (BGWMA); *PVW s.n.* (KANU); *BA2 5436* (SAT); *JF 1296, AMP & SAP 5125* (SRSC).

Caryophyllaceae

§ *Arenaria benthamii* Fenzl ex Torr. & A. Gray, Hilly sandwort, annual herb; *BRM s.n.* (BGWMA).

Paronychia jamesii Torr. & A. Gray, James nailwort, uncommon perennial herb, DSC, SYG, 3800–5800 ft; *BA2 5475* (SAT); *JF 235, 765, 1269a, MT 33, 248* (SRSC).

Celastraceae

Mortonia scabrella A. Gray, Tickbush, Rio Grande saddlebush, sandpaper bush, uncommon shrub, DSC, SYG, 3840–5000 ft; *PVW s.n.* (KANU); *JF 268, 1167, 2190, MT 2* (SRSC).

Schaefferia cuneifolia A. Gray, Desert yaupon, occasional shrub, DSC, DAR, DCA, 1900–3300 ft; *TR 126* (BGWMA); *JF 676, 973, 1366, 2041, AMP & SAP 4302, BHW 15912* (SRSC); *AMP & SAP 4302* (TEX-LL).

Chenopodiaceae

Atriplex canescens (Pursh) Nutt. var. *canescens*, Fourwing saltbush, uncommon shrub, DSC, DAR, DCA, SYG, 1800–4160 ft; *BA2 5262* (SAT); *JF 336, 861, 1091, 1410, 1895, 2143, MT 203, BHW & LCH BG-132* (SRSC); *BHW & LCH BG-132* (TEX-LL).

*◆ *Atriplex rosea* L., Tumbling saltweed, red orache, rare annual herb, RIO, 1800 ft; *AL 306* (BIBE); *AL 307, JF 2236* (SRSC).

Chenopodium berlandieri Moq., Pitseed goosefoot, rare annual herb, DAR, RIO, 1800–3440 ft; *JF 361, 616, 2122, 2238* (SRSC).

Corispermum americanum (Nutt.) Nutt., American bugseed, locally common annual herb, DSC, RIO, 1800–2100 ft; *BHW 8330, JF 2221, 2224* (SRSC); *DSC & HBC 30630, BHW 8330* (TEX-LL).

!# *Salsola tragus* L., Tumbleweed, locally common annual herb, RIO, 1800 ft; *JF 2252* (SRSC).

Suaeda suffrutescens S. Watson var. *suffrutescens*, [*Suaeda nigra* (Raf.) J.F. Macbr.], Desert seepweed, rare perennial subshrub, RIO, 1800 ft; *JF 2234* (SRSC).

Convolvulaceae

§ *Bonamia ovalifolia* (Torr.) Hallier f., Bigpod lady's nightcap, "locally common" subshrub, DSC, RIO, 1800 ft; *BA2, DG, TE, & PC 4551; JS 303* (BIBE); *HBC 30628* (NYBG); *BA2 5502* (SAT); *BGH 622, DAL 40, AMP 3347, AMP & JH 5696, AMP & SAP 3609, 5859, GLW 4482* (SRSC); *DSC & HBC 30628, AMP 3347, AMP & SAP 3609* (TEX-LL).

Bonamia repens (I.M. Johnst.) D.F. Austin & Staples, Creeping lady's nightcap, common subshrub, DSC, DAR, 1800–4280 ft; *CA & BA2 69, BA2 6191, SMU 41* (BGWMA); *CA s.n.* (SAT); *JF 154, 307, 435, 1075, 2062, 2131, MT 167, BHW & MCJ 16834* (SRSC).

Convolvulus equitans Benth., Texas bindweed, uncommon perennial herbaceous vine, DAR, DCA, RIO, 1800–4350 ft; *BRM 3149* (BGWMA); *JF 1945, EGM 150* (BIBE); *BA2 5309, 5470, 5720* (SAT); *JF 181, 853, 1349, 1432, 1945, 2077, 2116* (SRSC).

Dichondra brachypoda Wooton & Standl., New Mexico ponysfoot, rare perennial herb, DAR, DCA, 3056–4600 ft; *JF 859, 1122, AMP & SAP 5134* (SRSC).

Evolvulus alsinoides (L.) L. var. *angustifolius* Torr., Slender dwarf morning-glory, occasional perennial herb, DSC, DAR, DCA, 1900–3880 ft; *TR 249* (BGWMA); *BA2 5312, 5464* (SAT); *JF 209, 309, 957, 1472, 2060, TR 250; MT 127* (SRSC).

§ *Ipomoea cardiophylla* A. Gray, Heartleaf morning-glory, rare annual vine; *BHW 10799* (SRSC).

Ipomoea costellata Torr., Crest-rib morning glory, rare but locally common perennial herbaceous vine, SYG, 5300–5840 ft; *JF 1994* (BIBE); *JF 1969, 1994, MT 241* (SRSC).

§ *Ipomoea lindheimeri* A. Gray, Lindheimer morning-glory, "infrequent" perennial herbaceous vine, 3520 ft; *MA & AD 874* (SRSC).

Ipomoea rupicola House, Cliff morning-glory, occasional to uncommon perennial herbaceous vine, DSC, DAR, DCA, SYG,

3050–4800 ft; *JF 248* (BIBE); *JF 248, 308, 1103, 1186, 1196, MT 31, 144, 172, BHW 962, BLT & BD 23-167, OCW 352, BHW & LCH BG-148, BHW & MCJ 16828* (SRSC); *BLT & BD 23-167* (TEX-LL).

§ *Ipomoea tenuiloba* Torr., Spiderleaf, rare perennial herbaceous vine; *MT 236* (SRSC).

Crassulaceae

Echeveria strictiflora A. Gray, Siempreviva, desert savior, rare succulent, SYG/CHP, 5700–5840 ft; *BRM 3224* (BGWMA); *JF 1263, 1301, BHW 10774* (SRSC).

Sedum nanifolium Fröd., [*Sedum robertsianum* Alexander; *Sedum parvum* Hemsl. subsp. *robertsianum* (Alexander) R.T. Clausen], Dwarf stonecrop, rare but locally occasional succulent, SYG, 5150 ft; *JF 1215* (BIBE & SRSC).

Sedum wrightii A. Gray, Wright stonecrop, rare succulent, SYG, 4200–5000 ft; *JF 581, 1163, 1506* (SRSC).

Crossosomataceae

Glossopetalon spinescens A. Gray var. *spinescens*, [*Forsellesia spinescens* (A. Gray) Greene], Spiny greasebush, uncommon shrub, SYG, 4200–5000 ft; *PVW s.n.* (KANU); *JF 1205, 1505, BHW 10843* (SRSC).

Cucurbitaceae

Ibervillea lindheimeri (A. Gray) Greene, Lindheimer globeberry, rare perennial herbaceous vine, DSC, 3080 ft; *JF 1143* (SRSC).

§ *Ibervillea tenuisecta* (A. Gray) Small, Slimlobe globeberry, uncommon perennial herbaceous vine, DSC, 3500–3800 ft; *BA2 5368* (SAT); *MA & AD 3500, BHW 10802, MT 206* (SRSC); *BHW 10802* (TEX-LL).

Ebenaceae

Diospyros texana Scheele, Texas persimmon, common to occasional shrub, DAR, DCA, 1800–3840 ft; *BRM 3146, CMR 5080* (BGWMA); *BA2 5239, MC 157, CMR 15102* (SAT); *JF 689, 2088, WH, TA, LS, & JMP 8986* (SRSC).

Euphorbiaceae

Acalypha monostachya Cav.,[*Acalypha hederacea* Torr.], Round copperleaf, common perennial herb, DSC, DAR, DCA, 1850–3050 ft; *BA2 5237, 5334* (SAT); *JF 1069, 1118, 1680, BHW 646, 21200* (SRSC); *BHW 646* (TEX-LL).

Acalypha phleoides Cav., [*Acalypha lindheimeri* Müll. Arg.], Shrubby copperleaf, occasional perennial herb, DAR, DCA, 2200–4800 ft; *JF 1946* (BIBE); *TR 68, CMR 11583* (BGWMA); *BA2 5240, 5265* (SAT); *JF 1108, 1128, 1149, 1946, JF & MY 1315, TR 68, MT 187* (SRSC); *OCW s.n.* (TEX-LL).

Andrachne arida (Warnock & M.C. Johnst.) G.L. Webster, Trans-Pecos maidenbush, rare but locally common (G2S1) shrub, SYG, 4200–4900 ft; *JF 1170, 1194, 1207, 1499, 2164, 2177, BHW 10767, 1077; BHW & MCJ 16681, 16840, 16841* (SRSC).

Bernardia obovata I.M. Johnst., Desert myrtlecroton, occasional shrub, DSC, DAR, DCA, 1920–4900 ft; *CMR 5134, BHW & LCH s.n.* (BGWMA); *BA2, DG, TE, & B 4925* (BIBE); *BA2 5250, BR 293* (SAT); *JF 203, 496, 642, 715, 1093, 1212, MT 86, BHW 10832, BHW & LCH BG-178, BHW & MCJ 16833* (SRSC); *BHW 10832, BHW & LCH BG-178* (TEX-LL).

Chamaesyce acuta (Engelm.) Millsp., Pointed sandmat, rare perennial herb, SYG, 5700 ft; *JF 1264* (SRSC).

Chamaesyce albomarginata (Torr. & A. Gray) Small, Whitemargin sandmat, uncommon perennial herb, DSC, DAR, 1800–2560 ft; *JF 1447* (SRSC); *HBP & VLC 30177, OES 1540* (TAES).

Chamaesyce chaetocalyx (Boiss.) Wooton & Standl., Bristlecup sandmat, locally common subshrub, DSC, DCA, 1960–4600 ft; *BHW & LCH s.n.* (BGWMA); *JF 261, 652, 943, AMR & SAP 5142, MT 32, 68, BHW & LCH BG-176* (SRSC).

Chamaesyce cinerascens (Engelm.) Small, Ashy sandmat, occasional perennial herb, DSC, DAR, DCA, SYG, 1800–4450 ft; *OCW s.n.* (BGWMA); *BA2, DG, TE, & B 4934* (BIBE); *BA2 5291, 5526, 5705* (SAT); *JF 174, 340, 342, 489, 547, 653, 684, 863, 1078, 1087, 1171, 1337, 2133, 1645, AMP & SAP 3612, 5305, AMP, SAP, MLP, & AL2 6101, MT 3, 66, 67, 165, 166, BLT 22-146, BHW 10756, 10762, 10840, 18393, BHW & LCH BG-66, BHW & MCJ 15908, GLW 4442* (SRSC); *DSC & HBC 30632, BLT 22-146, BHW 10756, 10762, BHW & LCH BG-66* (TEX-LL).

Chamaesyce fendleri (Torr. & A. Gray) Small, Fendler sandmat, uncommon perennial herb, DSC, SYG, CHP, 3000–5250 ft; *JAM & JAS 3444* (NYBG); *BA2 5210, 5276, 5619, 5692* (SAT); *JF 784, 1235, 1243, 1470, 2197* (SRSC).

Chamaesyce glyptosperma (Engelm.) Small, Rib-seed sandmat, "frequent" annual herb, RIO, DSC, 1800–3120 ft; *JF 223, BHW & BLT 8317* (SRSC); *BHW & BLT 8325* (TEX-LL).

§ ***Chamaesyce golondrina*** (L.C. Wheeler) Shinners, Boquillas sandmat, rare but locally frequent (G2S2) annual herb, DSC, ca. 1800 ft; *AL 175, BHW 998* (BIBE); *WRC & PM212199, AMP & SAP 3613, BHW 20900, 20951, 20954, 23035, BHW & MCJ 16854, BHW & BLT 8325a, 8325b, GLW 4484* (SRSC); *AMP & SAP 3613* (TEX-LL).

+ *Chamaesyce serpens* (Kunth) Small, Matted sandmat, rare annual or perennial herb, DSC/DAR, 2400 ft; *JF 1422* (SRSC).

§ *Chamaesyce serpyllifolia* (Pers.) Small, Thyme-leaf sandmat, uncommon annual herb, DSC, 3800 ft; *BHW 10794* (TEX-LL).

Chamaesyce serrula (Engelm.) Wooton & Standl., Sawtooth sandmat, uncommon but locally frequent annual herb, DSC, SYG, 1800–5100 ft; *EGM 165* (BIBE); *JF 2196, BHW 10794, 10838* (SRSC); *BHW 10838* (TEX-LL).

Chamaesyce theriaca (Wheeler) Shinners, Terlingua sandmat, Terlingua broomspurge, rare to frequent annual herb, DSC, DCA, 1800–3800 ft; *CMR 15117* (SAT); *JF 2018, 2095, AMP & SAP 6138, 6139, BHW 13033, 23402, BHW & LCH BG-180, BHW & MCJ 16678, 16680, BHW & BLT 8325, 8326* (SRSC); *BHW & BLT 8325, 8326* (TEX-LL).

Chamaesyce triligulata (L.C. Wheeler) B.L. Turner [*Chamaesyce chaetocalyx* var. *triligulata* (L.C. Wheeler) Mayfield; *Chamaesyce fendleri* (Torr. & Gray) Small var. *triligulata* (L.C. Wheeler) Shinners], Bristlecup sandmat, three-tounge spurge, rare (G5T1S1) perennial herb, DSC, DCA, 1800–2200 ft; *AL 164, 165* (BIBE); *JF 1695, AMP & SAP 3611, BHW 20899, BHW & MCJ 16960* (SRSC).

Chamaesyce villifera (Scheele) Small, Hairy sandmat, rare perennial herb, SYG, 4360–5840 ft; *JF 1173, 1305, 1960* (SRSC).

Croton bigbendensis B.L. Turner, Big Bend croton, occasional perennial herb, DSC, 3000–3880 ft; *JF 292, 707, 1463, 1904, MT 158* (SRSC); *BLT & BD 23-163* (TEX-LL).

§ *Croton dioicus* Cav., Grassland croton, hierba del gato, locally "frequent and widespread" perennial herb, DSC, 2150 ft; *EGM 144* (BIBE); *WGD s.n.* (TAES); *BHW & LCH BG-64* (SRSC & TEX-LL).

Croton fruticulosus Engelm. ex Torr., Bush croton, encinilla, occasional perennial herb, DAR, DCA, 2200–4100 ft; *BRM 3137, TR 72, 73, OCW 314* (BGWMA); *JF 298* (BIBE); *JF 298, 300, 509, 1114, TR 72, 73, MT 40, 98, 256, OCW 340, BHW 10748* (SRSC); *BHW 10748* (TEX-LL).

Croton incanus Kunth, Torrey croton, rare shrub, DCA, 1800 ft; *JF 2128, BHW 18406* (SRSC).

+ *Croton lindheimerianus* var. *tharpii* M.C. Johnst., Tharp croton, rare annual herb, DSC/DAR, 2400 ft; *JF 1427* (BIBE & SRSC).

§ *Croton pottsii* (Klotzsch) Müll. Arg., Leatherweed, perennial herb, 2200–2400 ft; *TR 71* (BGWMA & SRSC).

Croton thermophilus (M.C. Johnst.) B.L. Turner [*Croton pottsii* var. *thermophilus* (M.C. Johnst.) M.C. Johnst], Leatherweed, occasional (G5T2S1) perennial herb, DSC, DCA, SYG, 1850–4400 ft; *BRM 3113* (BGWMA); *AL 158* (BIBE); *JF 175, 353, 431, 457, 682, 1077, 1397, 1541, 1932, 2011, 2058, MT 159, BHW 18401, 20895, BHW & MCJ 16837, 16862, BHW & BLT 8321, GLW 4439* (SRSC).

Ditaxis humilis (Engelm. & A. Gray) Pax, Low silverbush, rare perennial herb, DSC, 2560–2760 ft; *JF 152, 1404, BHW & LCH BG-201* (SRSC).

Ditaxis neomexicana (Müll. Arg.) A. Heller, New Mexico ditaxis, occasional to common perennial herb, DSC, DAR, 1800–3500 ft; *CMR 5032* (BGWMA); *EGM 133, BHW 12889* (BIBE); *BA2 5319, 5584* (SAT); *JF 168, 439, 674, 2051, BLT 22-151, BHW 12889, BHW & LCH BG-199, BHW & MCJ 16858* (SRSC); *BLT 22-151, BHW 12889* (TEX-LL).

Euphorbia antisyphilitica Zucc., Candelilla, common perennial herb, DSC, DAR, DCA, SYG, 1900–4400 ft; *BA2 5241, 5695* (SAT); *JF 259, 573, 778, MT 84, 170, BHW & MCJ 16839* (SRSC); *AT 2243* (TEX-LL).

Euphorbia brachycera Engelm., Horned spurge, uncommon perennial herb, DCA, SYG/CHP, 3500–5680 ft; *JF 160* (BIBE); *BHW & LCH s.n.* (BGWMA); *BA2 2513, 5445* (SAT); *JF 1273, 1290, 1934, 1940, AMP & SAP 5141, BHW & LCH BG-174* (SRSC).

Euphorbia eriantha Benth., Desert poinsettia, beetle spurge, uncommon annual herb, DSC, 1800–1850 ft; *JF 2010, 2103; BGH 634* (SRSC).

Euphorbia exstipulata Engelm., Square-seed spurge, uncommon annual herb, DSC, SYG, 2800–5840 ft; *JF 198, 1980, BHW & MCJ 16832* (SRSC).

Jatropha dioica Cerv. var. *graminea* McVaugh, Sangre de drago, leatherstem, common perennial herb, DSC, DAR, DCA, 1800–4360 ft; *CMR 17230* (BIBE); *BA2 5479* (SAT); *JF 709, 586, 2029, BHW 12902, 13073* (SRSC).

Phyllanthus polygonoides Nutt. ex Spreng., Knotweed leafflower, occasional subshrub, DSC, DAR, DCA, 1850–4360 ft; *BHW & LCH s.n.* (BGWMA); *JF 160* (BIBE); *BA2 5206, 5292, 5593, 5693* (SAT); *JF 160, 205, 297, 526, 825, 1074, 1400, TRV s.n., BHW & LCH BG-146, BHW & MCJ 16830, GLW 4450* (SRSC).

Tragia amblyodonta (Müll. Arg.) Pax & K. Hoffm., Dogtooth noseburn, uncommon perennial herb, DSC, DAR, DCA, 2680–5680 ft; *JF 146, 718, 832, 1297, BLT 22-150, BHW & LCH BG-188* (SRSC); *BLT 22-150* (TEX-LL).

Tragia ramosa Torr., Branched noseburn, uncommon perennial herb, DSC, 2120–5840 ft; *TR 74, CMR 5085* (BGWMA); *BA2 5208, 5283, 5694* (SAT); *JF 688, 1966* (SRSC).

Fabaceae

Acacia berlandieri Benth., Guajillo, rare tree, DSC, SYG, 2520–4700 ft; *JF 669* (BIBE); *JF 669, 2187, BHW 21189b* (SRSC).

Acacia constricta Benth. ex A. Gray, Whitethorn acacia, occasional shrub or tree, DSC, DCA, 2350 ft; *CMR 11592* (BGWMA); *LF 86, PAS 58* (SHST); *JF 1385* (SRSC); *VB 355* (TEX-LL).

Acacia farnesiana (L.) Willd. [*Acacia smallii* Isely], Huisache, uncommon tree, DSC, RIO, 1800 ft; *BHW 13040* (BIBE); *JF 2030, EJL 126-H, TCM 2003-66b, PM 2037, AMP 3348, BHW 13040, 18386* (SRSC); *AMP 3348, BHW 13040* (TEX-LL).

Acacia greggii A. Gray var. *greggii*, Catclaw acacia, uncommon shrub, DSC, DAR, DCA, 2350 ft; *SJ 6505* (SAT); *JF 1372, BHW 21201, 21204* (SRSC).

Acacia neovernicosa Isely, Viscid acacia, uncommon to occasional shrub or tree, DSC, DAR, DCA, 1800–3408 ft; *EGM 149* (BIBE); *JF 934, 1089, 1462, 2020a-c, BHW 20777* (SRSC).

+ *Acacia rigidula* Benth., Blackbrush acacia, uncommon tree, DSC/ RIO, 1000–1850 ft; *JF 2002, 2027* (SRSC).

Acacia roemeriana Scheele, Roemer acacia, common shrub or tree, DSC, DAR, DCA, 1800–4180 ft; *BRM 3116, BHW & LCH s.n.* (BGWMA); *JF 249, 644, 1012, BHW & LCH BG-147* (SRSC).

§ *Acacia schottii* Torr., Schott acacia, rare shrub or tree, DSC; *BHW 20896* (SRSC).

+ *Astragalus austrinus* (Small) Schulz, Smallflowered milkvetch, rare annual or perennial herb, DSC, DAR, DCA, 3000–3560 ft; *JF 426, 540b, 804* (SRSC).

§ *Astragalus mollissimus* Torr., Woolly locoweed, perennial herb; *BA2 4755, SJ 4755* (SAT).

§● *Astragalus wrightii* A. Gray, Wright milkvetch, annual herb; *VLC 43964* (TEX-LL).

+ *Calliandra iselyi* B.L. Turner, Falsemesquite, occasional subshrub, DSC, SYG, 2800–5150 ft; *JF 813, 938, 1142, 1324, 1469* (SRSC).

§ *Cercis canadensis* L. subsp. *mexicana* (Rose) E. Murray, Mexican redbud, "infrequent" to "common" tree, 3500–4600 ft; *BA2 5232* (SAT); *AMP & SAP 5140* (SRSC), *BHW & LCH BG-172* (SRSC & TEX-LL).

§ *Dalea aurea* Nutt. ex Fraser var. *aurea*, Golden prairie clover, perennial herb; *BRM 3223* (BGWMA); *BA2 5318* (SAT).

Dalea formosa Torr., Feather dalea, plume dalea, occasional shrub, DSC, DAR, DCA, SYG/CHP, 2560–5840 ft; *CMR 17225* (BIBE); *BA2 315, 5191, 5538* (SAT); *JF 483, 559, 1014, 1047, 1096, 1402, 1914, 1996, MT 136* (SRSC); *VB 342* (TEX-LL).

Dalea frutescens A. Gray var. *frutescens*, Black dalea, uncommon shrub, DSC, DAR, DCA, SYG, 3350–5800 ft; *BA2 5484, 5332* (SAT); *JF 374a, 1195, MT 230, 245, BHW 10754* (SRSC); *BHW 10754* (TEX-LL).

Dalea greggii A. Gray, Gregg prairie clover, uncommon subshrub, DSC, SYG, 3800–4600 ft; *OCW 9022* (BGWMA); *BA2 5277, 5469, 5548* (SAT); *JF 1038, OCW 337* (SRSC).

§ *Dalea jamesii* (Torr.) Torr. & A. Gray, James prairie clover, perennial herb; *BA2 5228* (SAT).

§ *Dalea laniceps* Barnebey, Woolyhead prairie clover, perennial herb; *MT 150* (SRSC).

§ *Dalea leporina* (Aiton) Bullock, Foxtail prairie clover, annual herb, DSC; *OCW 584-21* (TAES).

§ *Dalea longipila* (Rydb.) Cory, Downy prairie clover, uncommon perennial herb, DSC, DAR, ca. 2500 ft; *AMP & SAP 6140, BLT & MT2 97-344* (SRSC); *BLT & MT2 97-344* (TEX-LL).

\+ *Dalea nana* Torr. & A. Gray, Dwarf prairie clover, uncommon perennial herb, DAR, SYG/CHP, 2750–5700 ft; *JF 959, 1265* (SRSC).

Dalea neomexicana (A. Gray) Cory, New mexico dalea, "frequent" perennial herb, DSC, DCA, 1800–3440 ft; *BHW 13032* (BIBE); *JF 357, BHW 13032, BHW & MCJ 16679, BHW & BLT 8319, GLW 4473* (SRSC); *BHW 13030* (TAES); *BLT & MT2 97-334, BHW 13032, BHW & BLT 8319* (TEX-LL).

Dalea pogonathera A. Gray var. *pogonathera*, Bearded dalea, uncommon perennial herb, DSC, DAR, 3560 ft; *BRM 3119, OCW 5094* (BGWMA); *JF 461* (BIBE & SRSC); *BHW & LCH BG-196* (SRSC); *BA2 5377, 5488* (SAT); *VLC 43968* (TEX-LL).

§ *Dalea terminalis* M.E. Jones, [*Dalea lanata* var. *terminalis* (M.E. Jones) Barneby], Wooly prairie clover, uncommon perennial herb, DSC, DCA, 1800 ft; *BA2, DG, TE, & PC 4602, BHW 13030* (BIBE); *BLT, JDA & BHW 8337, BHW 13030, GLW 4480* (SRSC); *BHW 13030* (TAES); *DSC & HBC 30629, BHW 13030* (TEX-LL).

Dalea wrightii A. Gray, Wright dalea, uncommon perennial herb, DSC, DAR, 2750–3560 ft; *BA2 5430* (SAT); *JF 282, 468a, 962, MT 13, 15, 220, BLT & MT2 97-345, 97-349, BHW C300* (SRSC); *VLC 43969, BHW C300* (TEX-LL).

Desmanthus velutinus Scheele, Velvet bundleflower, uncommon perennial herb, DSC, DAR, SYG, 3360–5840 ft; *JF 227, 322, 713a, 1097, 1910, 1978, MT 35* (SRSC).

Eysenhardtia texana Scheele, Texas kidneywood, occasional shrub, DCA, DAR, 1800–4150 ft; *WFM 27, CMR 5125, 11611, OCW s.n., 320a* (BGWMA); *BA2 5254* (SAT); *SCB 223, JF 201, 1112, 1929, 2136, JF & MY 1318, MT 195, OCW 320, BHW & LCH BG-63* (SRSC).

Galactia sp., Milkpea, rare perennial herb, DAR, DCA, 1800–2780 ft; *JF 961* (BIBE); *JF 188, 940, 961, 1060, 2090, 2141* (SRSC); *JF 2090* (TEX-LL).

\+ *Hoffmannseggia drepanocarpa* A. Gray, Sicklepod rushpea, rare annual herb, SYG, 5300 ft; *JF 1998* (SRSC).

Leucaena retusa Benth., Goldenball leadtree, woohoo tree, occasional tree, DSC, DAR, DCA, 2200–5200 ft; *WFM s.n.* (BGWMA); *PVW s.n.* (KANU); *BA2 5190* (SAT); *JF 748, 1020, 1309, AMP & SAP 5144, TR 19, OCW 1, BHW 10849, BHW & LCH BG-135, GLW 4472* (SRSC); *RB 1502, BHW & LCH BG-135* (TEX-LL).

§ *Lupinus havardii* S. Watson, Big bend bluebonnet, annual herb, DAR, 2560 ft; *OES 1344* (TEX-LL).

*§● *Medicago sativa* L., Alfalfa, annual herb, 1800 ft; *EGM 136a* (BIBE & SRSC).

*§ *Melilotus indicus* (L.) All., Annual yellow sweetclover, "infrequent" annual herb, 1800 ft; *HTF 1225* (SRSC).

Mimosa aculeaticarpa Ortega var. *biuncifera* (Benth.) Barneby, Catclaw mimosa, common shrub, DSC, DAR, DCA, 3050 ft; *WFM 26, 29, 30* (BGWMA); *BA2 5238, 5702* (SAT); *JF 1150* (SRSC).

Mimosa borealis A. Gray, Fragrant mimosa, "infrequent" to common shrub, DAR, DCA, 1900–3760 ft; *JF 711, 1693, BHW 21186* (SRSC).

Mimosa emoryana Benth., Emory mimosa, occasional shrub, DSC, DAR, DCA, 2850–3560 ft; *JF 848, 970, GLW 4445* (SRSC).

\+ *Mimosa texana* (A. Gray) Small, Catclaw, occasional shrub, DAR, DCA, SYG, 1800–4600 ft; *JF 1015, 1019, 1357, 2145* (SRSC).

Mimosa turneri Barneby, Desert mimosa, Turner mimosa, uncommon shrub, DSC, DAR, SYG, 3000–4900 ft; *JF 1161, 1467, 1552, 2188* (SRSC).

Parkinsonia aculeata L., Retama, Jerusalem thorn, rare tree, RIO, 1800 ft; *DG 217* (BIBE); *JF 2257* (SRSC).

Peteria scoparia A. Gray, Rush peteria, rare shrub, DSC, 3840 ft; *JF 247* (SRSC).

Pomaria melanosticta S. Schauer [*Caesalpinia parryi* (E. Fisher) Eifert, Correll & Johnston; *Caesalpinia melanosticta* (S. Schauer) Fisher; *Caesalpinia wootonii* (Britt.) Eifert ex Isely; *Hoffmannseggia parryi* (Fisher) B.L. Turner], Parry holdback, occasional subshrub, DSC, DAR, DCA, 1800–3500 ft; *BRM 3148, CMR 5143a-c, BHW & LCH s.n.* (BGWMA); *AL 183; BHW 884, 12891* (BIBE); *BA2 5383, 5431* (SAT); *JF 148, 343, 655, 1328, 2130, 2182, BLT & MT2 97-332, BHW 10830, 12891, 20952, BHW & LCH BG-141, BHW & MCJ 16063, 16835, MT 221* (SRSC); *BHW & MCJ 16835* (SWT); *BLT & BD 23-168, BLT & MT2 97-332, BHW 12891, BHW & LCH BG-141* (TEX-LL).

\+ *Prosopis glandulosa* Torr. var. *torreyana* (L. D. Benson) M.C. Johnst., Mesquite, occasional shrub or tree, DSC, DAR, SYG, 1800–4400 ft; *JF 807* (SRSC).

\+ *Rhynchosia senna* Gillies ex Hook. & Arn. var. *texana* (Torr. & A. Gray) M.C. Johnst., Texas snoutbean, rare perennial herbaceous vine, DCA, 3050 ft; *JF 1119* (BIBE & SRSC).

\+ *Senna bauhinioides* (A. Gray) H.S. Irwin & Barneby, Twinleaf senna, occasional perennial herb, DSC, 2400–3000 ft; *JF 1457, 1465* (SRSC).

Senna lindheimeriana (Scheele ex Schltdl.) H.S. Irwin & Barneby, Lindheimer sennna, rare perennial herb, DSC, DAR, 1800 ft; *JF 2072, MT 101* (SRSC).

Senna orcuttii (Britton & Rose) H.S. Irwin & Barneby, Orcutt senna, uncommon (G2S2) perennial herb, SYG, CHP, 4200–5250 ft; *JF 1030* (BIBE); *JF 827, 1030, 1218, 1244, 2191, MT 110, BLT 22-153* (SRSC); *JF 1030, BLT 22-153* (TEX-LL).

Senna pilosior (Robinson ex J. F. Macbr.) H.S. Irwin & Barneby [*Senna durangensis* (Rose) H.S. Irwin & Barneby], Trans-Pecos senna, occasional perennial herb, DSC, DCA, 1800–3500 ft; *JF 437, 673, 1326, 1603, 2020, 2048, CNT263, BHW 20953, GLW 4475* (SRSC); *LEB 9640* (TAES); *BHW 20727* (TEX-LL).

§ *Senna pumilio* (A. Gray) H.S. Irwin & Barneby, Dwarf senna, 3200 ft; *PDW & BHW 319* (SRSC).

Senna ripleyana (H.S. Irwin & Barneby) H.S. Irwin & Barneby, Ripley senna, rare (G1SH) perennial herb, SYG, 4320–5000 ft; *JF 820, 1518, MT 214* (SRSC).

§ *Sophora secundiflora* (Gomez-Ortega) Lag. ex DC., Mescal bean, shrub, DCA; *BRM 3248* (BGWMA).

Vicia ludoviciana Nutt. var. *occidentalis* (Shinners) B.L. Turner,

Deer pea vetch, uncommon annual herb, DCA, 3560 ft; *BRM 3114* (BGWMA); *JF 540, BHW & MCJ 15994* (SRSC).

Fagaceae

Quercus grisea Liebm., Gray oak, uncommon shrub, CHP, 4880–5680 ft; *JF 757* (BIBE); *JF 744c, 757, 1246, 1258, 1280, 1282, 1320, MT 149, 225, 240, 250* (SRSC); *JF 1282* (TEX-LL).

§ *Quercus intricata* Trel., Dwarf oak, shrub, 5800 ft; *PVW s.n.* (KANU).

Quercus laceyi Small, Lacey oak, rare shrub, DCA, 4350 ft; *JF 1935* (SRSC). In Sue Peaks canyon.

Quercus mohriana Buckl. ex Rydb., Mohr shin-oak, uncommon shrub, CHP, 5240–5840 ft; *JF 1245, 1972, 2161* (SRSC).

Quercus pungens Liebm., [*Quercus pungens* subsp. *vaseyana* (Buckley) E. Murray], Sandpaper oak, occasional shrub, DSC, DCA, SYG/CHP, 3150–5680 ft; *CMR 15828, BHW & LCH s.n.* (BGWMA); *JF 303, 1223* (BIBE); *PVW s.n.* (KANU); *BA2 5193, 5203, 5214, 5224, 5225, 5243, 5251, 5275, 5279, 5328, 5450, 5459, 5485, 5709* (SAT); *JF 234, 303, 725, 736a, 749a-b, 818, 819, 1209a, 1220, 1022, 1045, 1223, 1308, 1550, 1709, 1897, JF & MY 1318a, AMP & SAP 5139, MT 76, 82, 83, 111, 112, 113, 117, 118, 130, 135, 139, 140, 142, 143, 186, 192, 194, 247, BHW 10755, 21184, 23397, BHW & LCH BG-163* (SRSC); *BHW 10755, BHW & LCH BG-163* (TEX-LL).

Fouquieriaceae

Fouquieria splendens Engelm., Ocotillo, devil's coachwhip, common shrub, DSC, SYG, 1800–4880 ft; *JM 89* (SAT); *JF 750, 779* (SRSC).

Garryaceae

Garrya ovata Benth. subsp. *goldmanii* (Wooton & Standl.) Dahling, Goldman or eggleaf silktassel, uncommon shrub, DCA, SYG, CHP, 4040–5840 ft; *PVW s.n.* (KANU); *JF 504, 770, 1202, 1239, 1307, PM 975, MT 114* (SRSC).

Gentianaceae

Centaurium arizonicum (A. Gray) A. Heller, Arizona centaury, Rosita, uncommon annual herb, DSC, DAR, RIO, 1800–3640 ft; *JF 710a, HTF 1232, MT 10* (SRSC).

Centaurium calycosum (Buckley) Fernald, Centaury, uncommon to "rare" or "sparse" annual herb, CHP, 5150 ft; *BA2 5194, 5689* (SAT); *JF 1323, AMP & SAP 5130, TR 153, MT 178, 196, BHW & LCH BG-156* (SRSC).

Eustoma exaltatum (L.) Salisb. ex G. Don, Catchfly prairie gentian, uncommon annual herb, RIO, 1800 ft; *BA2, DG, TE, & PC 4604, EGM 135, BHW 648, 13048* (BIBE); *JF 2254, BHW 13048* (SRSC); *BHW 13048* (TEX-LL).

Hydrangaceae

Fendlera falcata Thornber, Cliff fendlerbush, rare shrub, SYG, CHP, 4040–5840 ft; *JF 721a, 1266, 1277, 1963* (SRSC).

Philadelphus microphyllus A. Gray var. *microphyllus*, Littleleaf mockorange, rare shrub, SYG, CHP, 4040–4900 ft; *JF 719, 726, 753* (SRSC).

Hydrophyllaceae

#◆ *Nama dichotomum* (Ruiz & Pav.) Choisy, Wishbone fiddleleaf, rare annual herb, CHP, 5840 ft; *JF 1965* (SRSC).

Nama havardii A. Gray, Havard fiddleleaf, uncommon annual herb, DSC, DAR, 1800–3480 ft; *JF 317, 2035* (SRSC); *AT 2241* (TEX-LL).

Nama hispidum A. Gray, Bristly nama, uncommon annual herb, DSC, DAR, 1850–3560 ft; *AL 176* (BIBE); *JF 477, 1006, GLW 4467* (SRSC); *BHW C307* (TEX-LL).

Phacelia congesta Hook., Spike phacelia, bluecurls, uncommon annual herb, DAR, DCA, SYG, 2560–5080 ft; *JF 423, 505a, 744a* (SRSC); *RRI 556* (TEX-LL).

Phacelia pallida I.M. Johnst., [*Phacelia petiolata* I.M. Johnst.], Pale phacelia, rare (G2S1) perennial herb, DCA, 2780–2850 ft; *JF 185, 954* (SRSC).

§ *Phacelia popei* Torr. & A. Gray, Pope phacelia, annual herb, DCA, 2560 ft; *RRI 553* (TEX-LL).

Phacelia robusta (J.F. Macbr.) I.M. Johnst., Stout phacelia, rare to "infrequent" annual herb, DAR, DCA, 2000–3150 ft; *JF 1587, 1703, BHW 18402* (SRSC).

Juglandaceae

§ *Juglans major* (Torr.) A. Heller, Arizona walnut, tree, DCA; *CMR 2602, 2607* (SAT).

Juglans microcarpa Berland., Little walnut, occasional tree, DCA, 3050 ft; *JF 1151* (BIBE & SRSC); *WFM s.n., CMR 5130* (BGWMA); *BA2 5235* (SAT).

Krameriaceae

Krameria erecta Willd. ex Schult., Range ratany, uncommon shrub, DSC, SYG, 3800–4360 ft; *BA2 5344* (SAT); *JF 569, BHW 10792* (SRSC); *BHW 10792* (TEX-LL).

Krameria grayi Rose & Painter, White ratany, occasional shrub, DSC, DCA, RIO, SYG, 1800–4800 ft; *SMU 49, TR 52* (BGWMA); *BA2, DG, TE, & B 4920* (BIBE); *BA2 5189, 5480* (SAT); *JF 236, 371, 828, 1056, 1188, 1898, 2102, TR 17, 152, MT 85, BHW & LCH BG-195, BHW & MCJ 16863* (SRSC); *BHW 636* (TEX-LL).

Lamiaceae

Hedeoma costata Hemsl., Ribbed false pennyroyal, rare perennial herb, DCA, SYG/CHP, 4650–5680 ft; *JF 1283a, 1951* (SRSC).

§ *Hedeoma drummondii* Benth., Drummond pennyroyal, annual or perennial herb; *BLT 22-147* (TEX-LL).

Hedeoma nana (Torr.) Briq., Dwarf false pennyroyal, occasional annual or perennial herb, 2120–5800 ft; *JF 679* (BIBE); *JF 494, 534, 546, 679, 869, 949, 1042, 1270, 1329, 1702, 1719, BLT 22-152* (SRSC).

§● *Hedeoma plicata* Torr., Veiny false pennyroyal, perennial herb; *BRM 3129, CMR 5071* (BGWMA); *BLT 22-152* (TEX-LL).

#◆ *Hedeoma serpyllifolia* Small, Reverchon false pennyroyal, occasional perennial herb, DSC, SYG, 3560–5080 ft; *JF 740* (BIBE); *JF 230, 281, 740, 834* (SRSC).

§ *Mentha arvensis* L., Wild mint, rare perennial herb, 1800 ft; *EGM 158, 167, BHW 832* (BIBE); *BHW 832* (SRSC & TEX-LL).

Salvia greggii A. Gray, Autumn sage, uncommon shrub, DAR, DCA, SYG/CHP, 3500–5680 ft; *BRM & BPM 3103* (BGWMA); *JF 505, 766, 1283, 2171, TR 154, MT 107, BHW & LCH BG-171* (SRSC).

Salvia roemeriana Scheele, Cedar sage, Roemer sage, uncommon perennial herb, DCA, SYG/CHP, 2000–5840 ft; *JF 1284, 1671, 1675, 1975, BHW 18404* (SRSC); *BHW 18404* (TEX-LL).

§ *Teucrium depressum* Small [*Teucrium cubense* var. *densum* Jeps.; *Teucrium cubense* subsp. *depressum* (Small) E.M. McClint. & Epling], Small coastal germander, uncom-

mon annual herb, 1800–3520 ft; *HTF 1234, BHW 8331, GLW 4465* (SRSC).

Linaceae

Linum berlandieri Hook., Berlandier flax, occasional annual or perennial herb, DSC, DAR, DCA, SYG, 3560–4600 ft; *CMR 5090; BHW & LCH s.n.* (BGWMA); *ACK 827* (BIBE); *BA2 5338, 5568* (SAT); *JF 265, 295, 525, 552, 826, 1049, AMP & SAP 5137, BHW & LCH BG-149* (SRSC).

Linum hudsonioides Planch., Texas flax, rare perennial herb, DSC, 3800 ft; *JF & HL 1893* (SRSC).

Linum rupestre (A. Gray) Engelm. ex A. Gray, Rock flax, occasional perennial herb, DSC, DAR, DCA, 1800–3840 ft; *BRM 3136, BHW & LCH s.n.* (BGWMA); *BA2 5218, 5310, 5703* (SAT); *JF 241, 276, 847, 1016, 2071, MT 48, 177, TR 282, OCW 509, BHW 10828, BHW & LCH BG-84, BG-164* (SRSC); *BHW 10828* (TEX-LL).

Loasaceae

Cevallia sinuata Lag., Stinging cevallia, occasional perennial herb, DSC, DAR, DCA, 2000–3400 ft; *CMR 5077* (BGWMA); *JF 172, 808, 1383, 1724, MT 218* (SRSC).

Eucnide bartonioides Zucc., Yellow rocknettle, uncommon to occasional annual or perennial herb, DSC, DCA, 1800–3700 ft; *BA2 & PC 4754* (BIBE); *BRM 3104* (BGWMA); *BA2 4754, 5509* (SAT); *JF 177, 286, 532, 2089, BHW 18400, 20619* (SRSC).

+○ *Mentzelia mexicana* H.J. Thompson & Zavortink, Mexican blazingstar, rare perennial herb, DAR, DCA, 1800 ft; *JF 2031, 2066* (SRSC).

+Δ○ *Mentzelia multiflora* (Nutt.) A. Gray, Desert mentzelia, annual or perennial herb, observed at the Boquillas restoration site.

+○ *Mentzelia oligosperma* Nutt., Chickenthief, stickleaf, rare perennial herb, DSC, DCA, 2350–3720 ft; *JF 231, 1333* (SRSC).

Mentzelia pachyrhiza I.M. Johnst., Coahuila blazingstar, uncommon perennial herb, DSC, DCA, 2850–3640 ft; *JF 312, 840, 950, BHW 13071* (SRSC).

Loganiaceae

Buddleja marrubiifolia Benth., Wooly butterflybush, occasional shrub, DSC, DAR, DCA, 1850–3900 ft; *CMR 11586* (BGWMA); *SJ 6502* (SAT); *JF 150, 436, 835, 1375, 1721, 2012, MT 9, 168, BHW 10759, BHW & LCH BG-77* (SRSC); *BHW 10759, BHW & LCH BG-77* (TEX-LL).

Lythraceae

§ *Lythrum californicum* Torr. & A. Gray, California loosestrife, "infrequent" perennial herb, 1800 ft; *BHW 896* (TEX-LL).

Malphigiaceae

Janusia gracilis A. Gray, Helicopter bush, slender janusia, occasional perennial herbaceous vine, DSC, DAR, DCA, 1800–3720 ft; *EGM 122* (BIBE); *CMR 15112* (SAT); *JF 242, 647, 1332, AMP & SAP 5308, BLT & MT2 97-377, BHW 10793* (SRSC); *BLT & MT2 97-337* (TEX-LL).

Malvaceae

Abutilon malacum S. Watson, Yellow indian mallow, uncommon subshrub, DSC, DAR, DCA, 1850–2050 ft; *EGM 154* (BIBE); *JF 643, 1082, 1604, 1643, 2004, 2019, BHW 12886* (SRSC).

Abutilon parvulum A. Gray, Dwarf indian mallow, uncommon perennial herb, DSC, DAR, DCA, 2750–3700 ft; *AF 187* (BIBE); *JF 841, 969, 1140, 2169* (SRSC).

Abutilon wrightii A. Gray, Wright indian mallow, occasional perennial herb, DSC, DAR, DCA, 1800–3560 ft; *TR s.n.* (BGWMA); *JF 469a, 668, 1011, 1648, 2084, BLT & BD 23-171* (SRSC); *BLT & BD 23-171, BHW 9158, 10839* (TEX-LL).

§ *Herissantia crispa* (L.) Brizicky, Netvein mallow, "frequent" subshrub, DSC, DAR, 1800–1900 ft; *HCH s.n., BHW 13064* (SRSC); *HCH s.n.* (TEX-LL).

Hibiscus coulteri Harv. ex A. Gray, Desert rosemallow, occasional subshrub, 2400–4300 ft; *JF 444, 846, 1480, 1582, 2184, MT 51, BHW 10820, BHW & LCH BG-152* (SRSC); *BHW 10820, BHW & LCH BG-152* (TEX-LL).

Hibiscus denudatus Benth., Paleface rosemallow, rare subshrub, DSC, DCA, 3200 ft; *BRM 3120* (BGWMA); *JF 1471* (SRSC).

§ *Hibiscus martianus* Zucc.– Heartleaf rosemallow, "sparse" subshrub, 2100 ft; *OCW 358* (SRSC).

*# *Malva parviflora* L., Cheeseweed mallow, rare annual or perennial herb, RIO, 1800 ft; *AL 304, 308* (BIBE & SRSC).

§● *Malvella lepidota* (A. Gray) Fryxell, Scurfymallow, perennial herb, DAR, 2560 ft; *OES 1335* (TAES).

Malvella leprosa (Ortega) Krapov., Alkali mallow, dollarweed, rare perennial herb, DSC/DAR, 2400 ft; *JF 1423* (SRSC).

§ *Rhynchosida physocalyx* (A. Gray) Fryxell, Spearleaf sida, buffpetal, "infrequent" perennial herb, 2250 ft; *BRM 3171* (BGWMA); *BHW & LCH BG-194* (SRSC).

Sida abutifolia Mill., Spreading sida, occasional perennial herb, DSC, DCA, 1800–2850 ft; *JF 166, 956, 1325, 1439, 2008, HCH s.n.* (SRSC).

+○ *Sida longipes* A. Gray, Stockflower fanpetals, uncommon perennial herb, DSC, DAR, SYG, 3440–4800 ft; *JF 1539, 1920, 2175* (SRSC).

Sphaeralcea angustifolia (Cav.) G. Don, Narrowleaf globemallow, occasional perennial herb, DSC, DAR, DCA, RIO, SYG, 1800–5300 ft; *BRM 3121, CMR 11593* (BGWMA); *CN 499* (BIBE); *JF 585, 803, 1415, 1461, 1986, 2104, 2268, BH 641* (SRSC); *BHW 247* (TEX-LL).

§● *Sphaeralcea hastulata* A. Gray, Spear globemallow, "infrequent" perennial herb, DCA, 2560 ft; *RRI 21431* (TEX-LL).

Nyctaginaceae

Acleisanthes angustifolia (Torr.) R.A. Levin, Narrowleaf monopod, occasional to uncommon subshrub, DSC, DAR, DCA, 1800–3720 ft; *JF 243* (BIBE); *JF 243, 844, 1352, 2015, 2022, BLT & BD 23-160, BHW 9159, 10790, BHW & MCJ 16846, BHW & BLT 8324* (SRSC); *BLT & BD 23-160, BLT & MT2 97-346b, BHW 10790* (TEX-LL).

Acleisanthes longiflora A. Gray, Angel trumpets, hierba de la rabia, uncommon perennial herb, DSC, DCA, 1850–4000 ft; *BA2 5188* (SAT); *JF 1070, MT 157, GLW 4479* (SRSC).

Allionia incarnata L. var. *incarnata*, Trailing four o'clock, pink windmills, occasional perennial herb, DSC, DCA, 1800–2750 ft; *EGM 168* (BIBE); *BA2 5356* (SAT); *JF 171, 651, 936, 2065, AMP & SAP 5304, BHW 20879, BHW & MCJ 16848* (SRSC); *BHW 702* (TEX-LL).

§ *Ammocodon chenopodioides* (A. Gray) Standl. [*Acleisanthes chenopodioides* (A. Gray) R.A. Levin], Goosefoot monopod, perennial herb; *BLT & BD 23-160* (SRSC).

§ *Anulocaulis eriosolenus* (A. Gray) Standl. [*Boerhavia eriosolena* A. Gray], Big bend ringstem, "infrequent to locally common" annual or perennial herb, DSC, DAR, DCA, 1800–2320 ft; *EGM 146* (BIBE); *AMP & SAP 6141, BLT & MT2 97-351, BHW 16676, 20878, 20949* (SRSC); *DSC & HBC 30639, OES 1632, BLT & MT2 97-340* (TEX-LL).

Boerhavia anisophylla Torr., Wineflower, uncommon perennial herb, DAR, DCA, 1800–3000 ft; *JF 1468, 2073, 2134, AMP & SAP 3614, BHW 16690, BHW, BLT, & JDA 8335* (SRSC); *BHW 21031, BHW, BLT, & JDA 8335* (TEX-LL).

\+ *Boerhavia coccinea* Miller, Red spiderling, rare annual or perennial herb, DCA, 3065 ft; *JF 1120* (SRSC).

§ *Boerhavia intermedia* M.E. Jones, Spreading spiderling, uncommon to "frequent" annual herb, DSC, DAR, DCA, 1800–2320 ft; *AMP, SAP, MLP & AL2 6102, TRV s.n., BHW 20877, BHW & LCH BG-185BHW & BLT 8315* (SRSC); *HCH s.n., AMP & SAP 3614, BLT & MT2 97-342* (TEX-LL).

§ *Boerhavia linearifolia* A. Gray, Narrowleaf spiderling, annual herb, 4600 ft; *BA2 6190, CMR 5060, OCW 5810-1* (BGWMA); *BA2 5326* (SAT); *AMP & SAP 5120* (SRSC).

§ *Boerhavia spicata* Choisy, Creeping spiderling, "infrequent to frequent" annual herb, 1800 ft; *BHW 695, 20948, BHW & MCJ 16849* (SRSC).

§ *Boerhavia torreyana* (S. Watson) Standl., Creeping spiderling, annual herb, 2100 ft; *BHW 8315* (TEX-LL). Head of Boquillas Canyon in 1948. A newer taxon recognized in the Flora.

Cyphomeris gypsophiloides (M. Martens & Galeotti) Standl., Birdfruit, red cyphomeris, uncommon perennial herb, DSC, DAR, DCA, SYG, 1800–4360 ft; *JF 348* (BIBE); *BA2 5449* (SAT); *JF 348, 545, 951, 1172, 2086* (SRSC).

§ *Mirabilis albida* (Walter) Heimerl, White four o'clock, perennial herb; *BA2 5527* (SAT).

\# *Mirabilis linearis* (Pursh) Heimerl, Linearleaf spiderling, rare perennial herb, SYG/CHP, 5300–5840 ft; *JF 1982, 2159* (SRSC).

Mirabilis texensis (J.M. Coult.) B.L. Turner, Texas mirabilis, uncommon perennial herb, DSC, DAR, DCA, 2750–4200 ft; *JF 165, 809, 960, 1502, 2173, BLT & MT2 97-343, BHW 10776, 10844, BHW & MCJ 16829* (SRSC); *BLT & MT2 97-343* (TEX-LL).

§ *Nyctaginia capitata* Choisy, Devil's boquet, perennial herb; *TM 137* (SAT).

Oleaceae

Forestiera angustifolia Torr., Narrowleaf forestiera, common shrub, DSC, DAR, DCA, 1920–4400 ft; *BHW & LCH BG-153* (BGWMA); *BA2 5256, 5266* (SAT); *JF 374, 493, 572a, 2181, JF & HL 1899, AMP & SAP 5826, BHW 18411, 21203, BHW & LCH BG-153, BHW & MCJ 15996, GLW 4459* (SRSC); *WBM 2022* (TAES).

Fraxinus cuspidata Torr., Fragrant ash, rare to "sparse" tree, DAR/DCA, 3500–4800 ft; *BHW & LCH BG-173* (BGWMA & SRSC); *JF 1947* (SRSC).

Fraxinus greggii A. Gray, Gregg ash, common shrub, DSC, DAR, DCA, SYG, 2500–4900 ft; *TR 243* (BGWMA); *BA2 5358, 5570* (SAT); *JF 246, 568, 728, 1131, TR 296, MT 07b, BHW 20623, BHW & MCJ 15983* (SRSC).

Menodora longiflora A. Gray, Showy menodora, twinpod, occasional perennial herb, DSC, DAR, DCA, 2350–4600 ft; *CMR 5062, OCW 9027* (BGWMA); *JF 334* (BIBE); *BA2 5447, 5528* (SAT); *JF 226, 334, 517, 946, 1115, 1359, 1360, AMP & SAP 5122, 5145, MT 7* (SRSC).

Menodora scabra A. Gray, Rough menodora, common subshrub, DSC, DAR, DCA, 1800–5080 ft; *BHW 1123, 12887* (BIBE); *BA2 5699* (SAT); *JF 582, 754, 1482, 1520, BGH 639, MT 56, 180, 222, BHW 10783, 10803, 12887, 13037* (SRSC); *BHW 10783, 12887* (TEX-LL).

Onagraceae

§ *Calylophus greggii* A. Gray [*Calylophus hartwegii* (Benth.) P.H. Raven subsp. *pubescens* (A. Gray) Towner & P.H. Raven], Gregg sundrops, "infrequent" subshrub, 2150 ft; *HTF 1225* (SRSC).

Calylophus hartwegii (Benth.) P.H. Raven subsp. *hartwegii*, Hartweg sundrops, uncommon perennial herb, DCA, 1800–3050 ft; *BA2, DG, TE, & PC 4609* (BIBE); *BA2 5247* (SAT); *JF 1110, 117a, OCW 508* (SRSC).

Gaura boquillensis P.H. Raven & D.P. Gregory, Boquillas gaura, occasional (G2S2) subshrub, DSC, DCA, RIO, 1800–4400 ft; *JS & AL 301, 304* (BIBE); *JF 1363, 1380, 1538, 2091, 2117, 2147, AMP & SAP 3608, BHW 1008, 18397, GLW 4481* (SRSC); *BHW 1008* (TAES); *AMP & SAP 3608* (TEX-LL).

§ *Gaura calcicola* P.H. Raven & D.P. Gregory, Texas beeblossom, "infrequent" perennial herb; 2200–2400 ft; *TR 75* (SRSC).

Gaura coccinea Pursh, Scarlet gaura, occasional perennial herb, DSC, DAR, 2200–3520 ft; *TR 75* (BGWMA); *BA2 5186, 5248, 5290, 5306, 5522, 5563, 5576* (SAT); *JF 1418, 1460, BLT & BD 23-173, GLW 4449* (SRSC); *BLT & BD 23-173* (TEX-LL).

§ *Gaura parviflora* Lehm. [*Gaura mollis* Kunth], Velvetweed, perennial herb, RIO, 1800 ft; *AL 305* (BIBE).

§ *Ludwigia peploides* (Kunth) P.H. Raven, Floating primrose-willow, "infrequent to rare" perennial herb; RIO, 1800 ft; *HTF 1231, EGM 159* (SRSC); *EGM 159, BHW C297* (TEX-LL).

\+ *Oenothera brachycarpa* A. Gray, Shortpod evening-primrose, rare perennial herb, DCA, SYG/CHP, 3560–5200 ft; *JF 521, 1311, 1953* (SRSC).

Oenothera kunthiana (Spach) Munz, Kunth sundrops, occasional annual or perennial herb, DSC, DAR, DCA, RIO, 1800–3560 ft; *BRM 3170, CMR 5139* (BGWMA); *JF 510, HTF 1229, AMP & SAP 4300, 5388, BHW 18384, 47055* (SRSC); *RRI & BHW 21362* (TEX-LL).

§● *Oenothera laciniata* Hill, Cutleaf evening-primrose, annual or perennial herb; *BA2 5513, 5574* (SAT).

§ *Oenothera primiveris* A. Gray, Large yellow desert primrose, "frequent" annual herb, 2000 ft; *BHW & MCJ 16088* (SRSC & TEX-LL).

\+ *Oenothera rosea* L'Hér. ex Aiton, Rose sundrops, rare perennial herb, DCA, 1800–3000 ft; *JF 798, 2076* (SRSC).

§ *Oenothera triloba* Nutt., Stemless evening-primrose, "infrequent" annual or biennial herb, 1800–4000 ft; *BA2 5564* (SAT); *HTF 1228* (SRSC).

Orbanchaceae

Orobanche ludoviciana Nutt., Louisiana broomrape, uncommon annual herb, DAR, DCA, 1800–2120 ft; *BRM 3172* (BGWMA); *JF 677* (SRSC); *DSC & WOD 30714, BHW 838* (TEX-LL).

Orobanche multicaulis Brandegee, Spiked broomrape, oc-

casional annual herb, DAR, DCA, RIO, 1800–4080 ft; *JF 564, 931, BHW 738* (SRSC).

Oxalidaceae

§ *Oxalis drummondii* A. Gray, Drummond woodsorrel, perennial herb; *MT 228* (SRSC).

Papaveraceae

+ *Argemone chisosensis* G.B. Ownbey, Chisos mountain pricklepoppy, rare annual or perennial herb, DSC, DAR, 2350–2400 ft; *JF 1414, 1579* (SRSC).

§ *Argemone mexicana* L., Mexican pricklepoppy, rare annual herb, RIO, 1800 ft; *AL 299* (BIBE); *AL 300* (SRSC).

Argemone sanguinea Greene, Red pricklypoppy, rare annual or perennial herb, DSC/DAR, DCA, 2800 ft; *CMR 2605* (SAT); *JF 966* (SRSC).

Passifloraceae

Passiflora tenuiloba Engelm., Passionflower vine, occasional perennial herbaceous vine, DSC, DAR, DCA, 1800–4280 ft; *BRM 3150, 3150b; CMR 5082* (BGWMA); *AL 142, 143, 318* (BIBE); *BA2 5215* (SAT); *JF 189, 306, 963, 1076, 1361, 1591, 2129, TR 281, BHW 20606* (SRSC); *TR 249* (TEX-LL).

Pedaliaceae

§ *Proboscidea louisianica* Thell. subsp. *fragrans* (Lindl.) Bretting, Devil's claw, "infrequent" annual herb; 1800 ft; *BHW 12890* (SRSC).

Phytolaccaceae

Rivinia humilis L., Pigeonberry, uncommon perennial herb, DAR, DCA, 2920–3050 ft; *CMR 5031* (BGWMA); *JF 216a, 1137* (SRSC).

Plantaginaceae

Plantago helleri Small, Heller plantain, locally common annual herb, DSC, SYG/CHP, 3300–5300 ft; *OCW 584-20* (BGWMA); *JF 620, 785, 1250* (SRSC).

§ *Plantago hookeriana* Fisch. & C.A. Mey., California plantain, "infrequent" annual herb, DCA, 2560 ft; *BHW 21422* (TEX-LL).

+○ *Plantago patagonica* Jacq., Bristlebract plantain, uncommon annual herb, DSC, DAR, DCA, SYG, 1800–5300 ft; *JF 1252, 1609, 2082* (SRSC).

Plantago rhodosperma Decne., Redseed plantain, uncommon annual herb, DSC, DAR, DCA, 2350–2560 ft; *BRM 3112* (BGWMA); *RH 20, 43* (SAT); *JF 1335, 1430* (SRSC); *RRI 21423* (TEX-LL).

Polemoniaceae

Gilia incisa Benth., Splitleaf gilia, rare annual or perennial herb, DSC, 2850–4000 ft; *BA2 5308, 5573, 5577* (SAT); *JF 944* (SRSC).

§ *Gilia insignis* (Brand) Cory & H.B. Parks, Marked gilia, "infrequent" perennial herb, 2250 ft; *BHW & LCH BG-200* (SRSC).

Gilia rigidula Benth. subsp. *acerosa* (A. Gray) Wherry, Button gilia, blue gilia, uncommon annual herb, DSC, 3560–4300 ft; *BA2 5372* (SAT); *JF 245, 284, 870, MT 97* (SRSC).

Gilia stewartii I.M. Johnst., Stewart gilia, uncommon annual herb, DSC, DAR, 3400–4800 ft; *BRM 3221* (BGWMA); *BA2 5557* (SAT); *JF 498, 814, 1026, 2163, BHW 10761* (SRSC); BHW 10761 (TEX-LL).

§ *Ipomopsis havardii* (A. Gray) V.E. Grant, Havard ipomopsis, "infrequent" perennial herb; *BHW & MCJ 15907* (SRSC).

§● *Phlox nana* Nutt., Santa Fe phlox, [*Phlox mesoleuca* Greene], perennial herb; *BA2 5371, 5519, 5562* (SAT).

Polygalaceae

Polygala alba Nutt., White milkwort, uncommon perennial herb, DSC, CHP, 3500–5150 ft; *ACK 828* (BIBE); *BA2 5212, 5378* (SAT); *JF 251, 1227, MT 72, BHW & LCH BG-158* (SRSC).

Polygala barbeyana Chodat, [*Polygala longa* S.F. Blake], Narrowleaf polygala, occasional to uncommon perennial herb, DSC, DAR, DCA, SYG, 2200–5500 ft; *TR 122, BHW & LCH s.n.* (BGWMA); *BHW 1006* (BIBE); *BA2 5286, SJ 6506* (SAT); *JF 158, 252, 267, 288, 864, 1099, 1160, 1259, 1503, 2174, 2183, TR 122, CMR 5070, MT 28, 244, BHW 10798, 21197, 23401, BHW & LCH BG-169, BHW & MCJ 16826* (SRSC); *BLT & BD 23-172b, BHW 10798* (TEX-LL).

Polygala lindheimeri A. Gray var. *lindheimeri*, Shrubby milkwort, occasional perennial herb, DCA, 1800–3050 ft; *BA2 5196, 5244, 5696* (SAT); *JF 964, 1009, 1058, 1071, 1148, 2070, MT 12, 29, 200, BHW 10809, BHW & LCH BG-70, BG-134, BG-182* (SRSC); *JF 1071, BHW & LCH BG-134* (TEX-LL). This may be the species' western limit according to Turner et al. (2003). These two varieties intergrade in Brewster and Presidio County, and some individuals demonstrate mixed characters [e.g., *JF 964* (SRSC); Powell in prep.].

+ *Polygala lindheimeri* A. Gray var. *parvifolia* Wheelock [*Polygala tweedyi* Britton ex Wheelock], Shrubby milkwort, uncommon perennial herb, DSC, DCA, 1850–2600 ft; *JF 929, 1081* (SRSC).

Polygala macradenia A. Gray, Glandleaf milkwort, common perennial herb, DSC, DAR, DCA, 1850–4360 ft; *BRM 3226* (BGWMA); *ACK 824* (BIBE); *BA2 5228, 5547, 5553* (SAT); *JF 239, 275, 354, 854, 1529, 2007, BHW 10797, 20955, BHw & BLT 8316, GLW 4446* (SRSC); *BLT & BD 23-166, TRV, GLB & WEH 85-46, BHW & BLT 8316* (TEX-LL).

Polygala nudata Brandegee, Littleleaf milkwort, rare perennial herb, DSC, DCA, 1800–>4000 ft; *BA2, DG, TE, & B 4932, AL 312* (BIBE); *JF 1670, 1698, 2126* (SRSC).

Polygala scoparioides Chodat, Broom milkwort, occasional perennial herb, DSC, DAR, DCA, 2200–4800 ft; *CMR 5064, 11590* (BGWMA); *BA2 5289, SJ 6499* (SAT); *JF 425, 506, 580, 1165, 1190, 1365, TR 124, OCW 502, BHW 20624, 21199, GLW 4440, 4452* (SRSC); *BLT & BD 23-165, 23-172a* (TEX-LL).

Polygonaceae

Eriogonum havardii S. Watson, Havard buckwheat, rare perennial herb, DSC, 3350 ft; *JF 1718* (BIBE & SRSC); *JF 1714* (SRSC).

Eriogonum platyphyllum Torr. ex Benth., Broad-leaf wild buckwheat, occasional perennial herb, DAR, DCA, 1950–4600 ft; *JF 939, 1381, 1635, AMP & SAP 5123* (SRSC).

+○ *Eriogonum rotundifolium* Benth., Roundleaf buckwheat, rare annual herb, DAR, 2350 ft; *JF 1384* (SRSC).

§ *Eriogonum tenellum* Torr., Tall wild buckwheat, perennial herb; *BRM 3206* (BGWMA).

§ *Polygonum hydropiperoides* Michx., Swamp smartweed, "infrequent" perennial herb, 1800 ft; *BHW, BLT & JDA 8336* (SRSC).

§ *Polygonum pensylvanicum* L., Pennsylvania smartweed, [*Persicaria pensylvanica* (L.) M. Gómez], annual herb, 1800 ft; *BHW 641* (BIBE).

*§ *Persicaria maculosa* Gray [*Polygonum persicaria* L.], Spotted ladysthumb, "infrequent" annual herb, 1800–1850 ft; *EGM 161, BHW 642* (BIBE); *BHW 21517* (TEX-LL).

*§ *Rumex crispus* L., Curly dock, "infrequent" perennial herb, 1800 ft; *BHW 18387* (SRSC).

#◆ *Rumex maritimus* L., Golden dock, rare annual or biennial herb, DCA, 1800 ft; *JF 2118* (SRSC).

Portulacaceae

Talinum angustissimum (Engelm.) Wooton & Standl [*Phemeranthus aurantiacus* (Englem.) Kiger], Narrow-leaf fameflower, rare perennial herb, DAR, 1900 ft; *JF 2040a* (SRSC). Many treatments include this species under *Phemeranthus aurantiacus*: the Flora of North America (FNA 2003a) states that the purported distinctions creating separate species break down under a continuum of intergradation, but collections examined from Brewster County (*JF 2270-2274* SRSC) demonstrate that individuals clearly representing both concepts occur at the same site with no intergradation of characters (Powell in prep.).

+ *Phemeranthus aurantiacus* (Engelm.) Kiger [*Talinum aurantiacum* Engelm.], Orange fameflower, rare perennial herb, DSC, 3880 ft; *JF 293, 2040a* (SRSC).

Phemeranthus brevicaulis (S. Watson) Kiger, Dwarf fameflower, [*Talinum brevicaule* S. Watson], rare, locally common perennial herb, SYG/CHP, 5320–5840 ft; *JF 1967, 1967a* (SRSC).

Portulaca oleracea L., Purslane, verdolaga, rare annual herb, DAR, DCA, 2500–2880 ft; *TR s.n.* (BGWMA); *JF 204* (SRSC).

Portulaca pilosa L., Kiss me quick, occasional annual or perennial herb, DSC, DAR, DCA, SYG/CHP, 1800–5840 ft; *BHW 12901* (BIBE); *BA2 5281, 5379* (SAT); *JF 176, 240, 272, 1154, 1979, 2099, MT 6, 209, 243, BHW 12901, JF & MY 1316, BHW & MCJ 16843* (SRSC); *BHW 12901* (TEX-LL).

Primulaceae

§ *Anagallis arvensis* L., Scarlet pimpernel, annual or biennial herb, RIO, 1800 ft; *AL 303* (BIBE).

§ *Samolus ebracteatus* subsp. *cuneatus* (Small) R. Knuth, Limewater brookweed, "infrequent" perennial herb, RIO, 1800 ft; *EGM 130* (BIBE); *HTF 1223, BHW 13049* (SRSC).

Ranunculaceae

Anemone tuberosa var. *texana* Enquist & Crozier, Desert windflower, tuber anemone, rare perennial herb, DSC, DCA, 2560–4440 ft; *JF 562, BHW & MCJ 15986* (SRSC).

Clematis drummondii Torr. & A. Gray, Virgin's bower, old man's beard, common perennial herbaceous vine, DAR, DCA, RIO, 1800–4080 ft; *JF 178, 1334, 1424, TR 295* (SRSC).

§ *Ranunculus scleratus* L., Cursed buttercup, rare native herb; *BHW & RLU s.n.* (SRSC).

Resedaceae

+○ *Oligomeris linifolia* (Vahl) J.F. Macbr., Desert spikes, occasional annual herb, DSC, RIO, 1800–2600 ft; *JF 932, 2226* (SRSC).

Rhamnaceae

Ceanothus greggii A. Gray, Desert ceanothus, uncommon shrub, DCA, SYG, 4040–5840 ft; *PVW s.n.* (KANU); *BA2 5537* (SAT); *JF 727, 746a, 771, 1211, 1275, 1976, PM 974, MT 226, 239* (SRSC).

§ *Condalia ericoides* (A. Gray) M.C. Johnst., Javelinabush, shrub; *CMR 11624* (SAT).

Condalia viridis I.M. Johnst., Green condalia, occasional shrub, DSC, DAR, DCA, SYG, 2350–4880 ft; *JF 161, 744b, 1348, 1386, 1421, TVR s.n.* (SRSC).

Condalia warnockii M.C. Johnst., Warnock condalia, uncommon shrub, DSC, DAR, DCA, SYG, 1800–4650 ft; *JF 1185, 2085, BHW 10814* (SRSC); *BHW 10814* (TEX-LL).

Karwinskia humboldtiana (Willd. ex Roem. & Schult.) Zucc., Coyotillo, locally uncommon shrub, DCA, RIO /DSC, 1800–3150 ft; *BHW 834* (BIBE, SRSC, & TEX-LL); *JF 1595, 2001, 2135* (SRSC).

Ziziphus obtusifolia (Hook. ex Torr. & A. Gray) A. Gray, Lotebush, occasional shrub, DSC, DAR, DCA, 2200– ca. 4000 ft; *BA2 5226, 5261, 5706* (SAT); *JF 1312, 1419, 1426, TR 117* (SRSC); *AG 380* (TEX-LL).

Rosaceae

Cercocarpus breviflorus A. Gray [*Cercocarpus montanus* Raf. var. *paucidentatus* (S. Wats) F.L. Martin], Small-leaf mountain mahogany, rare shrub, CHP, 5800–5840 ft; *PVW s.n.* (KANU); *JF 1267, 1977* (SRSC).

Cercocarpus glaberoides R.A. Denham var. *glaber* [*Cercocarpus betuloides* Nutt.; *Cercocarpus montanus* Raf. var. *glaber* (S. Wats) F.L. Martin], Smooth mountain mahogany, uncommon shrub, DCA, SYG/CHP, 3500–5680 ft; *OCW 9036, BHW & LCH s.n.* (BGWMA); *PVW s.n.* (KANU); *BA2 5439, 5452* (SAT); *JF 716, 1021, 1197, 1274, 1278, 1281, MT 64, 109, 115, OCW 338, BHW & LCH BG-150* (SRSC). Trans-Pecos mountain mahoganies were previously treated as varieties of *Cercocarpus montanus* (Powell 1998) and are now recognized by some as different species (Turner et al. 2003, Powell in prep.).

Fallugia paradoxa (D. Don) Endl. ex Torr., Apacheplume, occasional to locally common shrub, DAR, DCA, 2350–4040 ft; *BRM 3108, TR s.n.* (BGWMA); *BA2 5249, 5329* (SAT); *JF 157, 1111, 1378, PM 978, TR 114, MT 201, BHW & LCH BG-168* (SRSC); *BHW & LCH BG-88* (TEX-LL).

Malacomeles denticulata (Kunth) G.N. Jones, [*Amelanchier denticulata* (Kunth) K. Koch], Serviceberry, uncommon shrub, DCA/SYG, CHP, 3800–5080 ft; *PVW s.n.* (KANU); *BA2 5536* (SAT); *JF 511, 717, 728a, 822, 1184, 1954, BHW 10826* (SRSC); *DHR 2298, BHW 10826* (TEX-LL).

Petrophyton caespitosum (Nutt.) Rydb., Mat rockspirea, tufted rockmat, rare subshrub, SYG, 4750–5840 ft; *JF 786, 1269, MT 232* (SRSC).

Prunus havardii (W. Wight) S. C. Mason, Havard plum, uncommon to occasional shrub DAR, DCA, SYG, 3050–5840 ft; *JF 1109* (BIBE); *JF 742, 1109, 1266a, 1973, PM 973* (SRSC); *BHW & LCH BG-140* (SRSC & TEX-LL).

Purshia ericifolia (Torr. ex Gray) Henrick., Heath cliffrose, common shrub, DCA, SYG, CHP, 2050–5150 ft; *BA2 6192, CMR*

5067, 5133, 15832, TR s.n. (BGWMA); *PVW s.n.* (KANU); *BA2 5366* (SAT); *JF 751, 948, 1098, 1601, 1672, 1902, MT 25, 94, 171, TR 115, BHW 10836, 16682, 20622, BHW & LCH BG-138, BHW & MCJ 16831* (SRSC); *BHW 10836, BHW & LCH BG-138* (TEX-LL).

Vauquelinia corymbosa Humb. & Bonpl. subsp. *angustifolia* (Rydb.) W.J. Hess & Henrickson, Narrow-leaf vauquelinia, occasional shrub or tree, DCA, SYG, 4200–4800 ft; *BA2 5555* (SAT); *JF 496a, 577, 862, PM 972, BHW 10778, 10784, BHW & MCJ 16683* (SRSC); *BHW 10778* (TEX-LL).

Rubiaceae

+○ *Galium proliferum* A. Gray, Limestone bedstraw, rare annual herb, DAR, DCA, SYG, 3500–5080 ft; *JF 428, 745* (SRSC).

Hedyotis acerosa A. Gray var. *acerosa*, Needleleaf bluet, common perennial herb, DSC, DAR, DCA, SYG/CHP, 3500–5840 ft; *BRM 3229* (BGWMA); *BHW 889* (BIBE); *JF 250, 287, 330, 480, 491, 824, 1051, 1101, 1717, MT 27a, 57, OCW 323, BHW 10825* (SRSC); *BHW 10825* (TEX-LL).

Hedyotis intricata Fosberg, Tangled starviolet, fascicled bluet, occasional shrub, DSC, DCA, SYG/CHP, 3800–5800 ft; *PVW s.n.* (KANU); *JF 294, 481, 749, 866, 1487, MT 91, 169, BHW & MCJ 16684* (SRSC).

Hedyotis nigricans (Lam.) Fosberg var. *nigricans*, Diamondflowers, common perennial herb, DAR, DCA, 1800–4360 ft; *BRM 3139* (BGWMA); *JF 500, AL 196* (BIBE); *BA2 5342* (SAT); *JF 156, 186, 424, 500, 541, 801, 823, 1129, 1530, 1924, 1925, 1926, 1931, JF & MY 1354* (SRSC); *BLT & MT2 97-335* (TEX-LL).

Hedyotis pooleana B.L. Turner, [*Stenaria mullerae* var. *pooleana* (B.L. Turner) Terrell], Jackie's bluet, occasional (G1T1S1) perennial herb, DSC, SYG, 2700–5680 ft; *JF 237, 713, 775, 1168, 1288, 1553, 1605, 1715, 1716, 1916, 1961, 1962, 2192, 2195, JF & MD 553, JMP 2527* (SRSC); *JMP 2527* (TEX-LL). This taxon is deserving of more systematic work; its relationship to the variable Mexican species *Houstonia mullerae*, and the regional *Hedyotis angulata* is of interest; in addition to the previously mentioned dispute over varietal versus specific designation of *Hedyotis pooleana*, two specimens of *Hedyotis angulata* seem to approach vegetative characters of *Hedyotis pooleana* (*Tharp 270*, *Warnock 23716* SRSC) which is supposedly restricted to the DH mountains. *Hedyotis pooleana* is also apparently slightly morphologically plastic, with a few specimens showing a more branched habit, even approaching *Hedyotis angulata*, as opposed to the characteristic densely-matted growth.

Rutaceae

Ptelea trifoliata subsp. *angustifolia* (Benth.) V.L. Bailey, Common hoptree, skunkbush, rare shrub, SYG, CHP, 4800–5680 ft; *BA2 327* (SAT); *JF 1213, 1294, 2162, MT 185* (SRSC).

Thamnosma texanum (A. Gray) Torr., Dutchman's breeches, Texas desertrue, occasional to uncommon perennial herb, DSC, DAR, DCA, SYG, 1800–5840 ft; *BRM 3122, CMR 5081* (BGWMA); *JF 488, 747, 1583, 1995, BHW 18394, BHW & LCH BG-69, BHW & MCJ 15906, GLW 4441* (SRSC).

Salicaceae

§ *Populus fremontii* S. Wats., Fremont cottonwood, locally occasional tree, RIO, 1800 ft; *EW 19709* (SRSC).

§ *Salix exigua* Nutt., Narrowleaf willow, coyote willow, "infrequent to frequent" tree; *BHW 12911* (SRSC); *BHW s.n.* (TEX-LL).

§ *Salix exilifolia* Dorn [*Salix taxifolia* Kunth], Yewleaf willow, tree; *EGM 166* (BIBE).

Salix nigra Marshall, Black willow, uncommon tree, DCA, RIO, 1800–2350 ft; *BHW 647* (BIBE); *JF 1344, BHW 18389* (SRSC); *EGM 71, BHW 21505* (TEX-LL).

Sapindaceae

+ *Sapindus saponaria* L. var. *drummondii* (Hook. & Arn.) L.D. Benson, Western soapberry, jaboncillo, rare tree, DAR, 3050 ft; *JF 1116* (SRSC).

Ungnadia speciosa Endl., Mexican buckeye, uncommon tree, DCA, 1800–4420 ft; *BRM 3109, TR 84* (BGWMA); *DB s.n.* (SAT); *JF 817, 1144, 2075, 2127, TR 84* (SRSC).

Sapotaceae

§ *Sideroxylon lanuginosum* Michx. ssp. *rigidum* (Gray) T.D. Pennington, Gum bully, ironwood, rare tree, DCA, 2560 ft; *AL 240* (BIBE); *BHW & MCJ s.n.* (SRSC).

Scrophulariaceae

§ *Castilleja integra* A. Gray var. *integra*, Wholeleaf indian paintbrush, perennial herb; *BA2 5227, 5345, 5390, 5448, 5460, 5542, 5588* (SAT); *BLT & BD 23-169* (TEX-LL).

Castilleja rigida Eastw., Rigid indian paintbrush, broadbract paintbrush, occasional perennial herb, DSC, SYG/CHP, 2150–5200 ft; *TR 111, OCW 9035* (BGWMA); *OES 1332* (BIBE); *SJ 6497* (SAT); *JF 151, 214, 331, 485, 774, 830, 833, 1210, 1580, 1720, 1908, AMP & SAP 5121, TR 111, MT 14, 126, 133, 148, 153, 154, BHW 10851, BHW & LCH BG-71* (SRSC); *BHW 10851, BHW & LCH BG-71* (TEX-LL).

Leucophyllum candidum I.M. Johnst., Boquillas silverleaf, occasional to common shrub, DSC, DAR, DCA, 1800–4080 ft; *EGM 153, BHW 13070* (BIBE); *JF 329, 567, 836, 837, 1464, 1711, 2092, 2124, PM 238, BHW 13070, BHW & LCH BG-61BHW & MCJ 16857* (SRSC); *BHW s.n.* (TEX-LL).

+ *Leucophyllum frutescens* (Berland.) I.M. Johnst., Barometer bush, ceniza, purple sage, rare shrub, DCA, 1800 ft; *JF 2083* (SRSC).

Leucophyllum minus A. Gray, Big Bend silverleaf, common shrub, DSC, DAR, DCA, 2600–4300 ft; *CMR 5066* (BGWMA); *BA 107* (BIBE); *DB s.n.* (SAT); *JF 244, 266, 470, 831, 842, 1162, MT 23, 24, 125, BLT 22-148, BHW 10804, BHW & LCH BG-161, GLW 4471* (SRSC); *BLT 22-148* (TEX-LL).

Maurandya antirrhiniflora Humb. & Bonpl. ex Willd. [*Maurandella antirrhiniflora* (Humb. & Bonpl. ex Willd.) Rothm.], Snapdragon vine, common perennial herbaceous vine, DSC, DAR, DCA, 1800–4080 ft; *BRM 3105, TR 110* (BGWMA); *JF 438, 971, TR 110, 113, MT 100, BHW 10807* (SRSC).

§ *Maurandya wislizeni* Engelm. ex A. Gray, Balloonbush, rare perennial herbaceous vine, RIO, 1800 ft; *AL 301* (BIBE); *AL 302* (SRSC).

Penstemon baccharifolius Hook., Baccharisleaf beardtongue, occasional perennial herb, DCA, 1800–4600 ft; *CMR 5061, SMU 39* (BGWMA); *AL 145* (BIBE); *JAS 3450* (NYBG); *JLB 866* (SAT); *JF 180, 838, 974, 1313, 1681, 2106, AMP & SAP 5124, TR 112, MT 95, 183, BHW & LCH BG-162* (SRSC).

Penstemon barbatus (Cav.) Roth, Beardlip penstemon, rare

perennial herb, DAR, DCA, 3160–4000 ft; *JF 222, MT 216, BHW 10732* (SRSC); *LCH & BHW BG-175* (TEX-LL).

+○ *Penstemon dasyphyllus* A. Gray, Cochise beardtounge, rare perennial herb, DAR/DCA, 4120 ft; *JF 724* (SRSC).

Penstemon lanceolatus Benth., Lanceleaf beardtounge, uncommon to "rare" perennial herb, 3500–5840 ft; *JF 1306, BHW & LCH BG-175* (SRSC); *JMP 2725, BHW 10752* (TEX-LL).

Seymeria falcata B.L. Turner var. *falcata,* Falcate blacksenna, locally common annual herb, DAR/SYG, 4000–5500 ft; *JF 1943* (BIBE, BRIT, SRSC, & TEX-LL); *JF 571, 1187, 1548, 1952, 1959; MT 137* (SRSC). New to the U.S. (Fenstermacher 2006).

Seymeria scabra A. Gray, Limpia blacksenna, uncommon annual herb, SYG, 4880–5840 ft; *BA2 5330* (SAT); *JF 744d, 1302; MT 255* (SRSC).

Stemodia coahuilensis B.L. Turner, Coahuila twintip, rare annual herb, DAR, 2200 ft. Photo documented by Roy Morey in February 2007: at the first mini-side drainage encountered when walking up the wash towards Ernst Tinaja from the parking area; "one clump" of plant(s) was found. Also known from Reed Plateau (Weckesser in prep). Rare in the U.S.; mostly a Mexican species from Cuatro Cienegas area (Henrickson 2005).

Simaroubaceae

Holacantha stewartii C.H. Mull., Crucifixion thorn, rare shrub, DSC, 3480–3700 ft; *JF 1145, JF & HL 1900, BHW 11760* (SRSC).

Solanaceae

§ *Calibrachoa parviflora* (Juss.) D'Arcy, Wild petunia, annual herb, RIO, 1800 ft; *AL 309* (BIBE).

Chamaesaracha pallida Averett, Pale five eyes, false nightshade, uncommon perennial herb, DSC, DCA, SYG/CHP, 1800–4800 ft; *JF 2204, BHW 16846, 21198, BHW & MCJ 16685* (SRSC).

Chamaesaracha sordida (Dunal) A. Gray, Hairy false nightshade, occasional perennial herb, DSC, DCA, 1900–3640 ft; *BHW & LCH BG-74* (BGWMA); *JEA & MWB 519, 520, CMR 17157, TXDOT 1324* (BIBE); *JF 290, 449, 629, 654, 965, 2047, BLT & BD 23-175, BHW 20898* (SRSC); *BLT & BD 23-175* (TEX-LL).

Chamaesaracha villosa Rydb., Trans-Pecos five eyes, wooly false nightshade, uncommon perennial herb, DSC, DAR, DCA, 1900–2560 ft; *JF 1442, TXDOT s.n., BHW 21205, BHW & LCH BG-74, BHW & MCJ 15909, BHW & BLT 8327* (SRSC); *JEA & TJW 172, BHW 21205* (TEX-LL).

Datura wrightii Regel, Sacred datura, thorn apple, annual or perennial herb, RIO, 1800 ft; *JF 2262* (SRSC).

Lycium berlandieri Dunal, Berlandier wolfberry, occasional shrub, DSC, DAR, DCA, 1800–3480 ft; *EGM 10, BHW 13025* (BIBE); *JF 1090, 1387, 1390, 1391, 1451, 2045, 2110, MT 205, BHW 13025, 13067, GLW 4463* (SRSC).

+○ *Lycium puberulum* A. Gray var. *berberioides* (Correll) F. Chiang, Downy wolfberry, rare shrub, DSC, 2350 ft; *JF 1392* (SRSC).

! *Nicotiana glauca* Graham, Tree tobacco, uncommon shrub, DCA, RIO, 1850 ft; *CN 11739* (BIBE); *CMR s.n.* (SAT); *JF 1063, 2260* (SRSC).

Nicotiana trigonophylla Dunal, Desert tobacco, uncommon annual herb, DSC, DAR, DCA, 2400–3500 ft; *CMR 16411* (SAT); *JF 370, 440, 1446* (SRSC).

Physalis cinerascens (Dunal) Hitchc. var. *cinerascens,* Smallflower groundcherry, uncommon perennial herb, SYG/CHP, 2300–5840 ft; *BA2 5231, 5311* (SAT); *JF 1981, MT 128, OCW 504* (SRSC).

Physalis hederifolia A. Gray, Ivyleaf groundcherry, uncommon to occasional perennial herb, DSC, DAR, DCA, 1800–4650 ft; *OES 1334* (BIBE); *JF 159, 216, 441, 1086, 1906, 2069, 2074, MT 36, 37, BHW 10779, BHW & MCJ 16825* (SRSC); *TRV & GLB 85-36, BHW 10779* (TEX-LL).

Quincula lobata (Torr.) Raf. [*Physalis lobata* Torr.], Chinese lantern, purple groundcherry, "infrequent/sparse" perennial herb, DSC, RIO, 1800–3800 ft; *BHW 1227, 10747, JF 2269* (SRSC); *BHW 10747* (TEX-LL).

Solanum elaeagnifolium Cav., Silverleaf nightshade, uncommon perennial herb, DCA, RIO, 1800–1850 ft; *EGM 160, BHW 645* (BIBE); *JF 1064* (SRSC).

§ *Solanum ptychanthum* Dunal [*Solanum americanum* Mill.], West Indian nightshade, annual herb; *EGM 137* (BIBE).

Solanum triquetrum Cav., Texas nightshade, uncommon perennial woody vine, DSC, DAR, DCA, SYG, 2780–4800 ft; *JF 162, 249a, 1035, 2176, 2178, 2185, PM 976, BHW & MCJ 16838* (SRSC).

Sterculiaceae

Ayenia filiformis S. Watson, Trans-Pecos or narrowleaf ayenia, uncommon subshrub, DSC, DCA, RIO, 1800–2250 ft; *CMR 17160* (BIBE); *JF 2034, BHW 18398, 20950, BHW & LCH BG-187* (SRSC).

Ayenia microphylla A. Gray, Dense ayenia, uncommon to occasional subshrub, DSC, DAR, DCA, 1800–4800 ft; *JF 1124, 1957, 2038, 2172, BGH 632, AMP & SAP 5307, BHW 20620* (SRSC); *DSC & HBC 30627, BHW 10791* (TEX-LL).

§ *Ayenia pilosa* Cristóbal, Hairy or dwarf ayenia, subshrub, 3000 ft; *BHW & LCH s.n.* (BGWMA); *BHW & LCH BG-139* (SRSC).

Tamaricaceae

!!§ *Tamarix aphylla* (L.) H. Karst., Athel tamarisk, saltcedar, locally occasional tree, DSC, RIO, 1800–1900 ft; *BHW 13052* (BIBE); *AMP 3349, BHW 13052* (SRSC); *AMP 3349* (TEX-LL). These large trees were historically planted around developed areas; those in the RGV area are being targeted and removed by NPS exotic plant eradication teams, as are the *Tamarix chinensis*, but they are firmly established in upstream areas and so will likely continue to reestablish along the river corridor into the future.

!! *Tamarix chinensis* Lour., Five-stamen tamarisk, saltcedar, locally abundant tree, DCA, RIO, 1800–ca. 4000 ft; *JF 1346, 2233, 2253, MT 179* (SRSC).

Ulmaceae

Celtis pallida Torr., Spiny hackberry, common shrub or tree, DAR, DCA, RIO, 1800–2800 ft; *CMR 5078* (BGWMA); *JF 2112, TR 80, MT 204 BHW 14048* (SRSC).

§Δ *Celtis reticulata* Torr., Netleaf hackberry, palo blanco, tree. Listed by Amos and Giles (1992) as occurring in Brushy Canyon. Known from BBNP and commonly through the rest of Brewster County.

Urticaceae

+o *Parietaria pensylvanica* Muhl. ex Willd., Pennsylvania pellitory, rare annual herb, DSC, DCA, 3150–3560 ft; *JF 538, 1701* (SRSC).

Verbenaceae

o *Aloysia gratissima* (Gillies & Hook.) Tronc., Beebrush, whitebrush, occasional shrub, DSC, DAR, DCA, 1880–3480 ft; *JF 671, 1362, TR 102* (SRSC).

+o *Aloysia wrightii* A. Heller ex Abrams, Wright beebrush, oreganillo, uncommon shrub, DSC, DCA, SYG/CHP, 3560–5080 ft; *JF 476, 746* (SRSC).

Bouchea spathulata Torr., Spoonleaf, occasional shrub, DSC, DAR, DCA, SYG, 1800–5000 ft; *BA2, DG, TE, & B 4927* (BIBE); *PVW s.n.* (KANU); *BA2 4927, SJ & GJ 6503* (SAT); *JF 170, 857, 1511, MT 1* (SRSC); *BHW 10749, 10766* (TEX-LL).

§ *Glandularia bipinnatifida* (Nutt.) Nutt. var. *ciliata* (Benth.) B.L. Turner [*Glandularia bipinnatifida* (Nutt.) Nutt.], Dakota mock vervain, uncommon perennial herb, DSC, DAR, RIO, 1800–3520 ft; *OES 1492* (BIBE); *HTF 1226, GLW 4466* (SRSC). The varietal status is based on recent chromosome work on this genus (Turner and Powell 2005).

Glandularia quadrangulata (A. Heller) Umber [*Glandularia verecunda* Umber], Beaked verbena, uncommon annual herb, DSC, DCA, RIO, 1800–3300 ft; *CMR 5140* (BGWMA); *JF 618* (BIBE); *CMR 16409* (SAT); *JF 618, HTF 1224* (SRSC); *BHW & RRI 21430* (TEX-LL). The individuals found in BBNP may be more appropriately placed under *Glandularia verecunda* based on different seed structure, with *Glandularia quadrangulata* being a more northerly distributed taxon (Powell in prep., Henrickson 2003).

§ *Glandularia wrightii* (A. Gray) Umber, Wright verbena, pinky, perennial herb; *CMR 16408* (SAT).

Lantana achyranthifolia Desf., Brushland shrubverbena, desert lantana, uncommon to occasional shrub, DSC, DAR, DCA, 1800–2780 ft; *TR 103* (BGWMA); *BA2 4636, 4936* (SAT); *JF 163, 947, 1364, TR 103* (SRSC); *BHW 831a* (TEX-LL).

Lippia graveolens Kunth, Mexican oregano, scented lippia, uncommon shrub, DSC, DAR, DCA, 1800–2350 ft; *DG & TE 4613, EGM 148, BHW 13065* (BIBE); *DG 4613* (SAT); *JF 1080, 1341, 1691, 2032, 2142, AMP s.n., 5306, 5823, BHW 13065, 21202* (SRSC); *BHW 831* (TEX-LL).

Phyla nodiflora (L.) Greene, Turkey tangle frogfruit, "frequent" perennial herb, RIO, DCA, 1800–2300 ft; *AL 321, BHW 833* (BIBE); *JF 2243, OCW 510, BHW 20435* (SRSC).

§ *Tetraclea coulteri* A. Gray, Coulter wrinklefruit, stinkweed, "infrequent" perennial herb, 2250 ft; *BRM 3209, CMR 5073* (BGWMA); *BA2 5717* (SAT); *BHW & LCH BG-184* (SRSC).

Verbena neomexicana (A. Gray) Small, Hillside vervain, New Mexico verbena, occasional to "abundant" perennial herb, RIO, DCA, 1800–? ft; *BRM 3047, CMR 11635* (BGWMA); *JF 2265* (SRSC).

Violaceae

Hybanthus verticillatus (Ortega) Baill., Babyslippers, uncommon to rare perennial herb, DSC, SYG, 3000–4900 ft; *JF 220, 1322, 2170, BHW 10895* (SRSC).

Viscaceae

Phoradendron hawksworthii (Wiens) Wiens , Hawksworth mistletoe, rare subshrub, DSC/SYG, 4160 ft; *JF 1896* (SRSC).

Phoradendron tomentosum (DC.) Engelm. ex A. Gray, Christmas mistletoe, uncommon subshrub, DSC, DCA, 2780 ft; *CMR 5097* (BGWMA); *JF 182* (SRSC); *AMP & SAP 4301* (SRSC & TEX-LL).

Phoradendron villosum Nutt., Oak or Cory mistletoe, uncommon subshrub, SYG/CHP, 2300–5000 ft; *PVW s.n.* (KANU); *JF 769, 1209, BHW 10845, 10846, OCW 505, BHW & LCH BG-145* (SRSC).

Vitaceae

+ *Cissus incisa* (Nutt. ex Torr. & A. Gray) Des Moul., Sorrelvine, ivy treebine, rare perennial woody vine, DSC, DAR, 2050–3740 ft; *JF 232, 1682* (SRSC).

§ *Vitis arizonica* Engelm., Canyon grape, "abundant" perennial woody vine, RIO, 1800 ft; *EGM 156, BHW 13038* (BIBE); *BHW 13038, GLW 4489* (SRSC).

Zygophyllaceae

Guaiacum angustifolium Engelm., Guayacan, Texas lignumvitae, common shrub, DSC, DAR, DCA, RIO, 1800–3280 ft; *CMR 5033* (BGWMA); *JF 224, 690, 2111, TR 96, BHW 18413* (SRSC).

§ *Kallstroemia grandiflora* Torr. ex A. Gray, Arizona poppy, "infrequent" annual herb, DSC, DCA, 1800–2320 ft; *BLT & MT2 97-336, BHW & MCJ 16867* (SRSC); *EGM 53, BLT & MT2 97-336* (TEX-LL)

o *Kallstroemia hirsutissima* Vail, Hairy caltrop, uncommon annual herb, DSC, 1900–3000 ft; *JF 199, 219, BHW 13066* (SRSC).

§ *Kallstroemia parviflora* Norton, Warty caltrop, annual herb; *BHW & LCH BG-197* (SRSC).

Larrea tridentata (Sessé & Moc. ex DC.) Coville, Creosote, gobernadora, abundant shrub, DSC, DAR, 1800–3560 ft; *ACK 829* (BIBE); *JJ 40, JT 30* (SAT); *JF 606* (SRSC); *DS 1091* (TEX-LL).

! *Tribulus terrestris* L., Goathead, puncturevine, "infrequent to frequent" annual herb, RIO, 1800 ft; *BA2, DG, TE, & PC 4607, EGM 157* (BIBE); *BA2 4607* (SAT); *JF 2227, BHW 23036, BHW & MCJ 16850* (SRSC).

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